SCHOLARSHIP AND LOAN PROGRAM

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE
COMMITTEE ON EDUCATION AND LABOR
HOUSE OF REPRESENTATIVES

EIGHTY-FIFTH CONGRESS

SECOND SESSION

ON

H. R. 10381, H. R. 10278 (and similar bills) relating to Educational Programs

HEARINGS HELD IN WASHINGTON, D. C.
JANUARY 8; FEBRUARY 3, 5, 6, 7, 10, 17, 18, 19, 20, AND 26;
MARCH 3, 4, 10, AND 12, 1958

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SCHOLARSHIP AND LOAN PROGRAM

WEDNESDAY, JANUARY 8, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION
OF THE COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittee met at 10 a. m. in room 429, House Office Building, the Honorable Carl Elliott (subcommittee chairman) presiding.

Subcommittee members present: Representatives Elliott, Green, McGovern, and Nicholson.

Full committee members also present: Representatives Landrum, Thompson, Teller, and Frelinghuysen.

Mr. ELLIOTT. The Subcommittee on Special Education will be in order.

On behalf of the Subcommittee on Special Education, I want to welcome each of you here this morning. We appreciate your presence, and we especially appreciate having this opportunity to hear testimony from Dr. Roscoe L. West, president emeritus of the State Teachers College of New Jersey, who is representing the American Council on Education.

It would be unnecessary, indeed, for me to remind you that only 90 days ago the American people were suddenly awakened to some of the shortcomings of our educational system. Today no one believes that the American system is superior simply because it is American. Our proud complacency has vanished. In the press, over the airwaves, on street corners and in homes, among business and professional men, including educators themselves, we now hear a constant clamor for the refinement of curriculum and for the improvement of teaching at all levels, from the grammar to the graduate school. The American people are excited about our schools and our colleges, our students, our teachers, our research programs, and our principles of instruction as they have seldom before been excited about anything of similar nature. They say that American education must be without parallel in the world and to that end we must do whatever needs to be done.

The subcommittee will have an opportunity to hear many other witnesses in the coming days as we try to fashion a program that will attack America's education deficiencies on a large scale.

This morning we are happy to have the gentleman from New Jersey, Mr. Frelinghuysen, who has been interested in educational problems of all sorts throughout the period of his service in Congress, sit with our committee.

We are happy to have with us this morning the gentleman from New Jersey, Mr. Thompson, who represents the district from which

Dr. Roscoe L. West comes, and I will ask Mr. Thompson if he will introduce Dr. West to the committee at this time.

Mr. THOMPSON. Thank you, Mr. Chairman. It is a particular pleasure for me to introduce Dr. West, not only because he is a distinguished and very widely known educator. He was for many years the president of the State Teachers College at Trenton, and at one time was the president of the Association of Presidents of State Teachers Colleges. He has written textbooks in the educational field and has spent his entire life in that field. In addition to that, he is one of our most distinguished citizens. His civic activities over the years have been too numerous to mention, but among them has been one particularly close to me and my family. He was president of the Mercer County Health and Tuberculosis League, of which my mother is secretary, and has been a member of the board for many years.

I had the good fortune to go through school with 2 of Dr. West's 3 children. Richard is chairman of the department of forestry at the agricultural school at the State University of New Jersey, Rutgers. I don't know if that is in Peter Frelinghuysen's district or not.

Mr. FRELINGHUYSEN. Not quite.

Mr. THOMPSON. His daughter Helen is married to a radiologist, and his third child is also an educator. So not only from a personal point of view but from a professional point of view, it is a great pleasure to introduce Dr. West.

Although I am not here to testify, I am vitally interested in this question of Federal scholarships. I notice in Dr. West's testimony he is going to emphasize the need for scholarships across the board. I have been very fearful myself that the scholarship legislation which I think almost all of us on this committee have been interested in and have introduced has tended toward science and engineering almost exclusively, and some of our basic educational problems are going by the board. Testimony from Dr. West and people of his stature in his field I think will be extremely valuable to the whole committee in deciding just what the educational needs as related to scholarships are. Our concepts have always been, as my colleague Mr. McGovern says, to educate the whole man, and the humanities must not be neglected, in my opinion and I am sure in Dr. West's, although we may have to have a temporary emphasis on science and engineering.

Mr. ELLIOTT. If I may interrupt, I would like to say that the chairman is cognizant of the fact the gentlemen has pending a bill which seeks to establish scholarships in many fields, including the humanities as well as the sciences.

Mr. THOMPSON. I am not alone. I know you, Mr. Elliott, Mrs. Green, Mr. Frelinghuysen, and others have also introduced legislation.

Having introduced Dr. West and having made my pitch, I take great pleasure in turning the Chair over to him.

Mr. ELLIOTT. Thank you very much, Mr. Thompson, and we are happy to have you, Dr. West.

May I introduce for your benefit the members of the committee.

On my immediate right is Mrs. Green, a Representative from the State of Oregon, and on her right is Mr. George McGovern, a Representative of the State of South Dakota, and on his right is Dr. Teller, a Representative of the State of New York.

And on my immediate left is the gentleman from Massachusetts, Mr. Donald W. Nicholson, and I have introduced Mr. Frelinghuysen already.

You may proceed in any manner you see fit, Dr. West.

TESTIMONY OF DR. ROSCOE L. WEST, PRESIDENT EMERITUS, NEW JERSEY STATE TEACHERS COLLEGE, TRENTON, N. J., REPRESENTING THE AMERICAN COUNCIL ON EDUCATION, ACCOMPANIED BY DR. ELMER D. WEST

Dr. WEST. Mr. Chairman and members of the committee, I would like to say at the start that it is a pleasure to be introduced by Mr. Thompson. I have followed his career with a great deal of interest. He did not mention the fact that when I was president of the Mercer County Health and Tuberculosis League I had the pleasure of watching him as a counselor of young children in a camp sponsored by that organization and I have followed his career since that time with a great deal of interest.

To my left is Dr. Elmer D. West. This is apparently a team of West and West. I asked him to sit here in case you have certain questions, because he was editor and compiler of this document, which I think you have in a group of things that have been distributed to you, entitled "Background for a National Scholarship Policy." This was done by a committee of the American Council on Education and was published in 1956. The purpose of this was to get together all the information we could find at that time which was pertinent to this whole question of the problem of scholarships. It was felt then that the Committee of the American Council on Education could not make any really valuable decisions until it had more information than was then available concerning the number of scholarships available, where they came from, and certain facts concerning them.

I am Roscoe L. West, president of New Jersey State Teachers College at Trenton from 1930 to 1957, and now president emeritus of that institution.

Mr. ELLIOTT. Dr. West, would you like to sit rather than stand? You may proceed in either way.

Dr. WEST. Thank you. Today I am representing the American Council on Education whose membership includes 142 educational organizations and 1,007 institutions, among them nearly all the accredited colleges, universities, and junior colleges in the United States. Until my retirement last year I served as a member of the council's committee on relationships of higher education to the Federal Government, and was chairman of the subcommittee on national scholarship policy. This subcommittee prepared a statement of guiding principles and administrative procedures which was approved in 1957 by a vote of more than 4 to 1 of the council membership, and which is the basis of the testimony we present today.

Mr. Chairman, it is our position that the Federal Government can and should assist in removing financial barriers to higher education for qualified students.

The cost of higher education has been steadily increasing and will continue to increase as institutions are faced with the necessity of ex-

pansion as well as improvement of quality in instruction. A recent study of the United States Office of Education reports that the cost of attending college has risen 100 percent since 1940, and the end of this trend is certainly not in sight.

The amount of financial support available to the college-age population from families, institutional scholarships and loans, and other sources has never been sufficient to permit a very high percentage of the best qualified students to enter college and continue to graduation. Only half of the most promising 7 percent of high-school graduates now find it possible to enroll. There is an increasing danger, as costs go up and existing sources of support, such as veterans' educational benefits, decrease, that the level of the individual family income rather than the student's capacity for intellectual achievement will become the basic determinant of who goes to college. Such a trend is obviously contrary to the public interest.

The American council recently published a careful study by Dr. Elmer D. West, Background for a National Scholarship Policy, which offers a wealth of evidence on scholarship needs in this country. I should like to quote several authorities as Dr. West has presented their statements in his book, and I have copies of the book for members of the committee who desire them.

Dr. Dael Wolfle, executive officer of the American Association for the Advancement of Science, has said:

> There was never enough of the most qualified workers in any field. Getting more of this bright group into college, giving them a broader view of the things they might accomplish, and letting each specialize in the field of his own choice would benefit all fields of specialization and be of profit to the Nation as a whole.

President Logan Wilson, of the University of Texas, in a prophetic article in School and Society in 1955, said:

> Our is a troubled age of intensified international competition which may at any time turn into the final world war. Under such circumstances we can no longer afford educating merely to help the individual get ahead economically or climb socially. The potential benefit of the college trained to society must cease to be regarded as incidental byproducts. In addition to a continued emphasis on self-development as an end in itself, we must also give more thought to the use of higher education as an instrument for our national survival.

The Director of the Office of Defense Mobilization in a report to the President on manpower resources for national security in 1954 said:

> The fact is that for various reasons a significant number of our most capable young people are not getting the education that their capacity seems to warrant * * *. In the light of the potential manpower needs of national security it seems clear that further steps can and should be taken to improve the development and utilization of men and women having high intellectual capacity.

There is, of course, a substantial amount of scholarship aid in existence now, but unfortunately we have no complete and authoritative evidence of the amount of this aid available. It is certain that in recent years there has been a steady increase in scholarships from the institutions, from various private sources, and from some of the States. We also know, however, that the number of recipients of veterans benefits had dropped sharply, a fact which in large measure has offset these increases. Even if the institutions, the various private sources, and the States continue their present contribution and provide reasonable increases, the weight of evidence and of opinion from the Nation's best authorities on the subject such as those cited in Dr. West's study

is that there exists the clear need for a scholarship program of a size which only the Federal Government can undertake.

Mr. Chairman, the Federal scholarship program which the American Council on Education recommends to meet the needs which I have set forth here in a program based upon the statement of principles approved early in 1957 by our membership to which I referred earlier. I should like to point out that many of these principles are embodied in various items of legislation now before Congress, and they are presented with special effectiveness in two bills before the House. These are H. R. 9506, introduced by Representative Elliott, the chairman of your subcommittee, and H. R. 8294 introduced by Representative Flood, of Pennsylvania. The council's statement of principles is as follows:

DESIRABLE FEATURES OF A FEDERAL SCHOLARSHIP PROGRAM

General objective

The objective of a Federal national scholarship program should be to offer the opportunity of college education to qualified students who would otherwise be denied it for lack of financial resources. Therefore, Federal funds should not be used to encourage students financially able to attend an adequate institution merely to seek admission to other institutions at a higher cost.

Guiding principles

1. Students should be selected on the basic of ability and achievement with stipends graduated according to need.

2. The student should have complete freedom to choose his own program of studies within the requirements set by the individual institution. Scholarships which are not restricted as to field of study are fairer to the individual because they permit him to develop his best abilities; they are better for the Nation because they insure a natural flow of qualified persons to all occupations.

3. Stipends, up to a maximum amount set generally for the program, should be sufficient to enable the student to attend an eligible college providing a course suitable to him.

4. However, the student should not be denied the opportunity to attend any recognized college or university properly accredited under the auspices of a regional accrediting association. For this reason, acceptance of a national scholarship should not preclude acceptance of supplementary assistance from other sources.

5. There should be no discrimination because of race, creed, color, or sex.

Administrative procedures

1. The standards for selection should be determined by the Office of Education in consultation with an advisory council appointed for this purpose, but the program of selection would be administered by the individual States under the supervision of educational authorities.

2. A fixed percentage quota (e. g., 7 percent in 1956 to produce 100,000 scholarships) should be selected from the secondary school graduating population of each State according to federally determined standards. For example, those students selected for their ability and

achievement by the local educators of each State would take a national test (or a federally approved test or tests). Each State would then fill its quota from the high scorers within that State.

3. The selection of national scholars should be made during the students' junior year to afford them the opportunity to plan their last year of high school work accordingly and to permit colleges to use their own funds to best advantage in aiding other qualified students. Provision should be made for awards to qualified seniors whose financial situation has deteriorated since the principal selection in the junior year.

4. Payment of the stipend should be made directly to the student.

5. The scholarships should be awarded only to undergraduates and for a maximum of 4 years.

6. Provisions should be made to pay demonstrable administrative costs incurred by both State agencies and institutions.

While I shall not take the time of the committee for discussion of each of these points, I should like to emphasize that our specific objective is to provide a college education to qualified students who would otherwise be denied it for lack of finances. By every reasonable precaution we must seek to avoid the mistake of merely encouraging students already financially able to attend an adequate institution, to seek admission to other institutions at higher cost.

You have noted in item 1 under administrative procedures that the educational authorities in each State would administer the program of selection, under standards determined by the Office of Education in consultation with an advisory council appointed for this purpose. Guiding principle No. 3 provides that the students included in each State's quota on the basis of their performance in the national test would be awarded stipends based on need, and sufficient to enable each to attend an institution adequate to meet his academic interests, located most conveniently in the geographical area. Principle No. 4 makes clear, however, that the acceptance of a national scholarship with a stipend based on demonstrated need and attendance at a particular college, should not prevent a student from using supplementary aid to enable him to attend another institution which he may prefer. By these procedures we can award stipends fairly, and provide a brake against the concentration of students in a few institutions, but avoid anything smacking of the regimentation of students.

I should like also to place special emphasis on principle No. 2. We believe—and I know you gentlemen and Mrs. Green will find very broad agreement on this in higher education—that scholarships should be noncategorical and across-the-board. If scholarships go primarily into science and mathematics, many talented young Americans will be tempted to leave the subject of their true and natural interest, in which they can serve best, for subjects in which they pretend an interest chiefly because of available scholarships. This would mean not only the waste of scarce teaching resources in mathematics and science, but the misuse of our Nation's priceless resources of men and women.

In order to learn more about this subject, the National Science Foundation entered into a contract with the Educational Testing Service, Princeton, N. J., to study the educational and vocational attitudes of 1955 high-school seniors. In the Foundation's annual report

tor 1955, the following significant facts on the influence of scholarships assistance were set forth:

> The responses indicate that if scholarships in the physical sciences were offered to high ability boys, they would atract 35 percent of those primarily interested in the social sciences, 27 percent of those primarily interested in business, and 26 percent of those interested in education. Scholarships in engineering would siphon off 72 percent of those interested in the physical sciences, 30 percent of those interested in the biological sciences, 46 percent of those interested in fine arts, and 34 percent of those interested in education. Scholarships in education, however, would attract only 18 percent of those primarily interested in physical science, 19 percent of those interested in engineering, and 34 percent of those interested in business.

The costliness of any program that would tend to pull young people out of their natural areas of prime interest and ability is recognized by the institutions and organizations of the American Council on Education. In the council's poll on this question, which I have referred to previously, a clear majority opposed scholarships restricted to specific curriculums.

The general basis for disapproval by educators of scholarships limited to narrow purposes was set forth in a statement adopted by representatives of the council's organization members in 1956, and I think parts of it will be of interest to the members of this subcommittee. These educational leaders said:

> American culture owes its origin and vitality to spiritual, moral, intellectual, and artistic values. Our country will continue to depend on higher education for leadership in the preservation and cultivation of these values. An enormous demand for trained intelligence and moral character to meet a wide variety of requirements must be satisfied if our people are to continue to fulfill their personal aspirations and to contribute effectively to national aims and worldwide relationships. A wide diversity of knowledge and skills is needed by our dynamic economy. The demands for trained intelligence come from the professions and vocations, from business and industry, from Government, from agriculture, from labor, from every identifiable segment of our society. To meet these demands, the opportunity must be given to every American citizen to attain the highest level of education and training of which he is capable. * * *
>
> Higher education will be called upon to supply an increasing number of persons with a wide range of skills and abilities, many of these in new fields resulting from the growth of technology and from our Nation's closer relations with the rest of the world. Yet no matter how specialized their work, graduates of the future will have to find their way in a more complicated society, and will be confronted with complex human problems requiring the broader training associated with the liberal arts. The need for men and women trained in the various specialized fields and at the same time equipped with broad human understanding is certain to make a demand upon our society's reservoir of talents far greater than we are currently prepared to supply. * * *

The specific dangers of categorical scholarships have been well described in the report to the President by his Committee on Education Beyond the High School. This committee, composed as you know of leaders broadly representative of business, education, and the professions, said in a section on Findings and conclusions on financial assistance to students:

> Categorical assistance is generally undesirable at the undergraduate level. It may discriminate against the best development of student talent. Where categories are based upon field of study, they tend to force feed particular occupations at the risk of shortages in others, and to cause inappropriate career decisions. Since opportunities may change even while the student is being trained, the involuntary decision may prove to be an employment barrier, as well as a misdirection of individual talents. At the graduate level, categorical programs cause less concern, because graduate students are more mature and have usually chosen their goals.

On the question of the number of scholarships which the Federal Government should provide, I must report that the American council has never polled its membership specifically on this point. However, when our survey was made in 1957, we included as a matter of information, a section on "Estimated cost of a general Federal scholarship program." Here we based our estimate on 100,000 talented high-school graduates, the number currently estimated as unable to continue their education largely for financial reasons.

We have noted that the Department of Health, Education, and Welfare is proposing 10,000 scholarships, that the National Education Association has recommended 20,000 scholarships, and that Representative Elliott and Senator Hill are sponsoring legislation for 40,000 scholarships. While the council's membership has not provided us with a mandate on this, it seems obvious that the figure of 10,000 scholarships is a minimum below which a program of effectiveness would be doubtful. The United States has about 25,000 senior high schools. A program of only 10,000 scholarships would mean that even if no more than 1 student in any high school received an award, 15,000 high schools would receive no scholarship recognition at all. Actually, of course, there would tend to be a concentration of awards in the larger and better staffed schools.

Any Federal scholarship program should have value not only for the individuals who win scholarships, but also in the stimulus and challenge it would bring to all students. This should be a program which arouses ambition in our youth for a college education, which offers hope of fulfillment of that aroused ambition, and which, through the opportunity thus presented inspires the best of our youth to meet the challenge of the future.

Mr. Chairman, we all know that today the intelligence, the foresight, and the capacity for decisive action on the part of the peoples of the free world is under challenge. The question is being asked, "Can the Americans, with their freedom, develop and use their potential strength as well as other nations which scorn freedom?" We believe that a soundly planned program of Federal scholarships, with the safeguards which I have described, will be one part of the evidence that we Americans have the intelligence to perceive the challenge, the foresight with which to plan for meeting it, and the capacity for decisive and courageous action required to meet it successfully.

Mr. ELLIOTT. Thank you very much, Dr. West.

Dr. West, it appears to me that the mood of the country—and I say this having returned from making 121 visits in my Congressional District to confer with the people in the area I represent—that the mood of the people is that America move on immedaitely to obtain sufficient scientists in the various fields to put us in the position of not only being competitive with the Soviet Union but of surpassing the Soviet Union in those fields, as I think all of us generally feel should be true.

Now, if I have correctly assessed the thinking of the people that I represent, and if that is the thinking of the people of America generally, must we not at this time put some extra emphasis in any program we may develop on the scientific subjects? It seems to me that that is a must. I don't know how we are going to do it, to tell you the truth; I don't know the mechanics that we may follow.

As you mentioned, Senator Hill and I have been working on a bill, we are still working on it, that we think will chart the way in this complex field, but I would like to have your idea as to how we might go about doing things that your organization stands for and yet give an extra boost toward the training of more scientists and engineers and those types of people that are apparently rather badly needed.

As a background for that I have the same general knowledge that you have that the Russians now are training about 3 times as many engineers as we are training, and I hope and trust and pray that those engineers are not as capable as ours are, but nevertheless I am a bit perturbed by the fact that there are 3 times as many of them, generally speaking, as there are American engineers.

Then a second thing that comes to my mind, we have said all along that the Russian system of education was highly selective and that consequently only the brightest students were given an opportunity to educate themselves; yet I notice in 1956 the Russians graduated a million and a half high-school students while we were graduating in this country 1,300,000. Granted the Russian population is 35 or 40 million more than ours, yet the fact she graduated more high-school students—if that be a fact, and that is the information this committee has—if she graduated more high-school students than we did, it indicates she is pursuing a rather broad educational system that is not as selective as we had at one time thought it was.

Dr. WEST. Mr. Chairman, I, of course, would have to answer some of those questions as an individual, and not representing the council. Perhaps I ought to make clear that the American Council on Education is very careful not to give pronouncements which would seem to involve the total membership of the council. The council represents the majority view to the best of its ability.

As a matter of fact, when the council sends these questionnaires to individual institutions, it makes very clear that the person who answers the questionnaire, usually the president, is speaking for himself and not necessarily for his institution or his board of trustees. The council has been very careful about that, and some of these figures that I gave today were the results of carefully prepared questionnaires that went to the membership.

For example, the 4-to-1 vote that we got in favor of Federal scholarships is the vote of presidents of institutions and probably none of them ever referred that to the board of trustees, and if to the faculty, merely by consultation. What I am saying, on this point, I am saying individually.

I think we ought to be very careful in this country to keep our controls of education in the hands of the States, as we always have, and it seems to me that the Federal Government, in whatever it does, ought to keep that very thoroughly in mind. You will notice that one of the principles of this document that I read speaks of keeping the administrative control even of scholarships in the hands of the States, with perhaps advice and some controls by Federal agencies in connection with the standards of selection.

I believe that much of this matter of encouragement of people in science and mathematics should be on the graduate level (and that already, of course, is being taken care of in part by the National Science Foundation). If we can get into the colleges as undergrad-

uates a larger percent of well-qualified people, which would be done by a larger scholarship program, then with proper guidance and understanding of the situation, and with opportunities to pursue graduate work, more people will go into these fields that we now think of as short in manpower.

We spoke of the fact here—I do not think it was completely brought out—but there have been several studies made by different groups, one by the College Entrance Board, and they all seem to come out just about the same, that in various sections of the country approximately 50 percent of the upper quarter of high-school students do not go to college.

We are losing a vast reservoir of talent there. The reasons for that seem to be mixed. The financial reason apparently is the most important, but there is also a matter of motivation. Many of these young people do not care to go to college. They have not had the advantages of college and of their possible future careers pointed out to them. Then, of course, in our American society many young people can earn as much money, or perhaps more, if they go into occupations immediately from high school as they would earn if they went to college.

That is something the people of the United States will have to take care of, so that the monetary rewards for people who go to college, go into professions, science, technology, engineering, et cetera, will be enough to entice them into that kind of a career.

It is our belief that a program of Federal scholarships would bring into college a large number of these upper-quarter students who do not now go. We believe many of those students would be capable in the fields of science, technology, mathematics, engineering, and would go on in those fields.

I believe that is the type of answer I would have to give to that question.

Mr. ELLIOTT. I am impressed, Doctor, with the fact that there are many, many people who have the motivation to attend college and the ability—and I get this largely from my correspondence and from my contact with young people, who, if we had a program that they could take advantage of, would go. I just received this letter before I came up here. It is written in longhand on this piece of paper. It is from a young fellow who says, "I am in favor of such an expanded program." He is referring to my bill, which he read about in the paper. [Reading:]

> I have been accepted at the University of Chicago and even received high ratings in science and the humanities. However, I do not have the money so I am not in school.

I think that there are thousands of boys and girls like that in America who would take advantage of a program such as we are talking about.

Dr. WEST. I think the studies that you mentioned showed that; that the most important reason given by these upper-quarter people for not going to college was lack of financial ability.

Mr. ELLIOTT. It seems to me also, Doctor, based upon my observations and studies in this field, that in the high schools we could very well profit from a system of counseling and guidance particularly for these brighter students, which many, many of the high schools do not have.

What can we do, preserving education, wholly and completely as you stated, and with which I agree in the States and local communities, and yet encouraging guidance and counseling programs that will present to these young boys and girls in high school the opportunities that may await them in the scientific fields, and in other fields?

Dr. WEST. I must answer as an individual, since the Committee on Relationships of Higher Education to the Federal Government has not concerned itself with this problem. I would go even further than you have gone and say much of this guidance must be before they get to high school, at the junior high school level, grades 7, 8, 9, because if a young person is going to go on to college, to take particularly science, mathematics and engineering, he must take a kind of sequential program, beginning with his entrance into high school, so that a great deal of counseling is needed at the seventh and eighth grade level.

I do not know what can be done on that so far as the Federal Government is concerned. I think the very existence of Federal scholarships would help the States and would stimulate them to give more guidance to the lower levels of the secondary school and the upper levels of the junior high school, so that these young people would be motivated to take the tests and prepare themselves to get these scholarships.

I think that, in itself, would stimulate the States to do more in the guidance program.

Mr. ELLIOTT. We are faced with a very real problem, too, Doctor, I find, in the high schools of the lack of scientific equipment, or rather, equipment with which to teach the sciences.

I have been absolutely appalled at what I have seen this fall in numerous high schools that I have visited with respect to their equipment. One school I visited showed me its laboratory equipment which had been built by the shop class in the school, and it was so meager that the teacher, in the presence of the students, remarked that she could teach only the barest fundamentals in the sciences.

Another high school I visited I asked to see the laboratory and was shown one waterspout, together with something similar to a washbasin under that waterspout, and that constituted the laboratory of that school, in toto.

If our scientists are made in the junior high schools and in the high schools, as you have indicated, or if the training process must begin there, what can we do about the problem that I have just mentioned, or do you consider it to be a real problem in the overall field?

Dr. WEST. Yes, undoubtedly it is a real problem. That, of course, will come back to a large extent to the desire of the people in local communities to build really well-equipped high schools. Of course, some States in this growth of population which we are witnessing are going to have to build new high schools, and in many States there is a movement for the consolidation of districts, where the high schools will be larger.

I am inclined to think, with the general public arousal right now to this problem, that in these new high schools and in consolidation of districts we will see better laboratories.

In New Jersey, for example, the estimate is that 100 new high schools have got to be built in the next 6 years because of growth of population. There is a tremendous surge in some other States to consolidate

districts and get larger schools. Of course, there are many factors to that.

One is the development of good roads which make transportation to high schools possible. In the old days high schools were small because every individual district wanted its own high school and transportation was difficult to other high schools. In the State of Maine right now there is a considerable activity going on in consolidation of districts, and that will help in getting larger schools, where more money is available for having good laboratories.

Mr. ELLIOTT. Do you feel, Doctor, that a loan program is an integral and essential part of this scholarship program that we are studying?

Dr. WEST. Our results in our vote and in our poll of the presidents indicated that about 40 percent of those who answered—and we had a large number answering—felt that a loan program would be good as a supplement to a scholarship program, but not as a substitute for it; that it alone would not be sufficient to attract many of these desirable students to go to college. Many loan funds now available are not used.

Mr. ELLIOTT. In the event that that we set up a loan program, would you personally, or as representing your American Council on Education, recommend that the loans be repaid with interest or without interest?

Dr. WEST. Personally, I would say at a small, low interest.

Mr. ELLIOTT. Would you recommend that the loans be repaid over a period of, says 10 years, following graduation?

Dr. WEST. Not over that.

Mr. ELLIOTT. Not over that?

Dr. WEST. No. I think it is better to get it paid back soon.

Mr. ELLIOTT. Would you recommend that the graduate be allowed 1 year following graduation before his payments started?

Dr. WEST. Yes. I think that would be a good provision.

Mr. ELLIOTT. Would you be inclined then to recommend a 5-year repayment period rather than 10, as I gathered from your statement?

Dr. WEST. That would be a little hard to say. I do not think 5 years would be unreasonable. It is a pretty good thing for a young man. Of course, if he is going on to graduate work, beyond his undergraduate level, he has to think of at least three 3 years more, so that there might be a provision that if a person goes into graduate work, the first payment of a loan be deferred for at least a year beyond his final educational goal.

That might mean at lest 4 years beyond his undergraduate degree. Now, in that case the 10-year period would be about right. Give him 6 or 7 years to repay his loan. I should think that the 10-year period, with these other provisos, would be reasonable.

Mr. ELLIOTT. We have had some very fine testimony on loan programs, and one in particular, where the testimony was to the effect that the repayment rate of loans made by certain institutions in the Midwest had been quite as good as the repayment rate made by borrowers at the First National Bank of the city in which the institution was located.

Dr. WEST. It is possible that Mr. Nicholson knows something of the Grange fund in Massachusetts. That is a fund which is a pretty large fund now and I thing it has had very good success in collecting the loans made.

Mr. ELLIOTT. One thing we have noted has been the fact that most of these loans have required such early repayment as to discourage the students from borrowing. We have studied, or had called to our attention, loans that had to be repaid, for instance, in 6 months, or certainly many of them within 1 year.

You would agree that loans that provide for such early repayment on the part of the student might not be very helpful to him?

Dr. WEST. I think that is true.

Mr. ELLIOTT. Mrs. Green?

Mrs. GREEN. Dr. West, the American Council on Education, I notice on the first page, represents 1,000 institutions, nearly all of them accredited colleges. Are these teachers' colleges only?

Dr. WEST. No. The most important members of the American Council are the large universities and liberal arts colleges. I would not know exactly, but I would assume there are about 75 teachers' colleges in this list of 1,000.

Mrs. GREEN. Turning to page 5, and to specifics, which this committee will have to get down to in drawing up a bill, I notice that in item 2 you mention a fixed percentage quota. Then you say:

> Each State would then fill its quota from the high scorers within that State.

Do you believe that the State boundary line is really that important, or do you think it is more important to get the best brains, regardless of whether they come from Oregon, New York, Alabama or any other States?

Dr. WEST. Of course, there are arguments for making this on a national basis, but I think you, with your experience in Congress, would know what would happen if that were done. There are many parts of the country where for various reasons the high schools are small and perhaps there has not been the opportunity to get to such high standards as in other parts, and if this program were on a completely national basis, some of those areas would be pretty neglected. Yet there might be some brilliant people there who, if given an opportunity, could develop themselves in college—particularly in this upper quarter.

I think the general opinion of the council people has been that even though you step down further into what might be called the high ability of the population in some States, in regions, than you would in others, it is wise to keep it by States, because, after all, you are only dealing with a very small percent of the upper group, so that in any State or region, regardless perhaps of some lack of opportunities, you would not get unqualified people.

You probably know that there has been criticism of that sort of thing—that is, of concentrating awards in certain areas—in connection with even the Rhodes scholarship awards and with the Fulbright awards.

Mrs. GREEN. But if you have a youngster in New York, or in any State, for instance, who has an IQ of 160, and the quota for New York is filled, then you go to another State and you take in a youngster with an IQ of 120 with equal motivation, do you think that is really the way we are going to get the brains of the country for future scientists?

Dr. WEST. With such a small number of scholarships in comparison with the number of 12th grade graduates, I do not think you would

get down very far in that IQ level in any State. There would be differences, of course. You also get differences in the possibilities of other scholarships. When you speak of New York State, for example, in New York they have more State scholarships than any other State, even in relation to the population going to college. That opportunity would exist, as well as the Federal scholarship opportunity.

After all, this is not the only scholarship program. It is a supplement to all other programs.

Mrs. GREEN. I noticed a bill was dropped in the hopper yesterday that each Congressional District should have five scholarships. Would you favor that and put it on a really geographical area?

Dr. WEST. I do not think I would. I would rather make it a larger area, such as the State.

Mrs. GREEN. In point 5, you say "The scholarship should be awarded only to undergraduates." Why do you say that?

Dr. WEST. I think it is the opinion of the council that the National Science Foundation can be expanded to take care of graduate programs. Dr. West, am I right about that? Will you advise me on that?

Dr. ELMER D. WEST. At the time we were doing this we were concerned only with scholarships. The council's Committee on Relationships of Higher Education to the Federal Government is preparing a separate plan for graduate fellowships.

Dr. ROSCOE WEST. In our understanding there is a difference between what we call a scholarship and what we call a fellowship. A fellowship is usually awarded for a graduate program. The scholarship is considered to be at the undergraduate level. We were talking only of that as we made this investigation.

Mrs. GREEN. As this committee is trying to work out a program to get this 50 percent of the top quarter, do you not think we should also consider the graduates?

Dr. WEST. On the graduate level?

Mrs. GREEN. Yes.

Dr. WEST. I think they should be considered in the total program; yes. There ought to be consideration of how that is to be done; whether it is to be done in this same manner or whether it is to be done through an organization like the National Science Foundation, which is already in existence. I understand there is a separate proposal now under consideration, by the American council, for graduate fellowships, but that was not taken up in this particular program which we speak of here.

Mrs. GREEN. On point 5 you do not mean that Federal scholarships should be awarded only to undergraduates?

Dr. WEST. We do not mean that all aid from the Federal Government should be restricted to that. No, I am sure we would not mean that there should be no other Federal aid. We were talking about this specific scholarship program.

Mrs. GREEN. On point 6, I presume you are saying that you would match the scholarship funds with a certain amount to the institution?

Dr. WEST. No. That is not the idea. You probably would have, let us say, a council in each State which would work out this program, and you would have some expenses there which would be very small, and institutions themselves perhaps would have a few ex-

penses. Such expenses in relation to the total program, however, would be extremely small.

Mrs. GREEN. Do you think that direct aid should be given to the institution, as we increase the enrollment, supposedly?

Dr. WEST. The council has not instructed me on this, but speaking for myself, personally, no. I do not believe so.

Mrs. GREEN. You do not think the colleges are having a real struggle?

Dr. WEST. Yes, they are having a real struggle. Of course, as you know, we have two types of colleges in this country, the independent, or private, and the State, and their sources of income are going to come from different sources. The major support for the State institutions will have to be the State. There are, of course, some State institutions that get grants from the Federal Government, such as the land-grant institutions and others like that, but in the main the State institutions are going to get their support from the State. The private institutions will, as they have in the past, I think, have to get their support, for the most part, from endowment funds, tuition payments, and increase of those funds.

Although they will have to grow in the next few years, it seems to me that it will be a question of selection of students by them.

Mrs. GREEN. As we were holding hearings across the country, there seemed to be considerable sentiment among the representatives from the colleges that, if the Federal scholarship program were initiated, there was also a responsibility on the part of the Federal Government to aid these individual institutions. The added number of students would increase the cost to these institutions which are today having difficulty meeting current costs.

Dr. WEST. Mr. Howes of the council tells me that the Committee on Relationships of Higher Education to the Federal Government, of which I am no longer a member, is now studying that whole question as to whether or not there ought to be aid to the institutions, but this subject was not a part of the study and survey on which I am testifying.

Of course, we have had some experience with that in connection with the GI bill. The first GI bill, as you know, Public Law 346, did give certain aid to the institutions. The bill that has been in existence for the last few years gave it directly to the student and the GI went and bought his education, just like any other student.

Among educators, there was considerable difference of opinion about that. A great many colleges resisted the second bill, and felt that there should be some aid to the colleges, but that bill was never changed and, personally, I always felt that the second bill was the sounder, that it resulted in better relationships between the Government, the colleges, and the individuals, but the matter is one that will certainly have to be studied.

Mrs. GREEN. On page 6 I note that you say:

> Sufficient to enable each to attend an institution adequate to meet his academic interests, located most conveniently in the geographic area.

From that, and back on page 4, do I interpret that to mean that you would actually recommend, or you are recommending, a limitation on the choice of the college which the student might attend?

Dr. WEST. No, what we have tried to make clear is that in considerations of the finances involved, the Federal Government, after studying

a student's need, ought to try to give him enough so that he can go to an institution that is reasonably close to his home and that offers the kind of education that he wishes to get.

On the other hand, we have tried to make very clear here that if he could get additional scholarships from another institution or perhaps earn money himself, he ought to have the choice of going to another institution and not lose his Federal scholarship. In other words, let us suppose that he gets $800 from the Federal Government. Maybe he could go to a local institution for that, but if he wants to go to Princeton or Harvard or some other place, it might cost him $2,600. Let us suppose he could get $800 or $1,000 from the institution and he could earn $600 or $700. If he is ambitious enough to do that, we feel that he ought to be allowed to do it and should not be penalized by having anything taken away from him because he goes to a more expensive institution.

That leaves it pretty free, I think. It gives the student an opportunity to go to his local institution, if he cannot get more money than is given to him by the Federal scholarship, but it also gives him an oportunity to go to a more expensive institution if he can get additional sources of revenue.

Mrs. GREEN. You say that the amount of the scholarship would vary from student to student?

Dr. WEST. Yes. We think it ought to be based on a study of his need. Some students' families could put up part of the expense and his scholarship would, therefore, be less than that for another student whose family can give nothing. There have been some studies in recent years, particularly by the Educational Testing Service of Princeton, that seem to indicate that this kind of study of student and family need can be made quite accurately.

Mrs. GREEN. Are you saying that, for instance, a boy in my State of Oregon who is tremendously interested in science and wants to go to MIT—MIT and California Institute of Technology being, I think, two of the best—then the Federal Government would recommend a certain amount of money which would enable him to go to an Oregon school?

Dr. WEST. I think that is the maximum that would be possible that could be done.

Mrs. GREEN. Then a boy who lives in Massachusetts——

Dr. WEST. If he lives in Cambridge, he has that much advantage. He can go to MIT because he lives there. That is a matter of chance and accident.

Mrs. GREEN. Of course, cost is much higher if you live in Cambridge.

Dr. WEST. That is right. There is a tremendous cost in living expense for the youngster. I do not think we could get any program of Federal scholarships without such a limitation, and as we have said, we would fear the idea of sending too many students to a given institution.

Mrs. GREEN. I notice that you are not recommending that anyhow. You are recommending a certain amount to the individual that be paid directly to him.

Dr. WEST. That is right.

Mrs. GREEN. I have sensed this across the country, that there is a jealousy—I guess that is not the word—but a feeling on the part of representatives from some of the colleges that if there are Federal

scholarships, they want to be sure to get their share and they do not want these scholarships to go to the big colleges in the country.

Dr. WEST. That is right.

Mrs. GREEN. Is this back of their thinking and is this really going to get our best brains to the colleges and develop the kind of creative scientists and leaders that we need in every field. Is it not more important to forget the individual college and see that we get the student of real ability to the college and that he should go to the college that will provide the kind of education really needed?

Dr. WEST. We have 1,800 institutions of higher education in this country, many of them very excellent institutions. It is entirely possible a program like this would stimulate their facilities so that there might not be a feeling among students that they should go to just a few. I think in most of the regions of the country, except perhaps in certain specialties, students can find good programs in what they need reasonably close to home.

Then, as we say, if the student wishes to go to some other institution that has more facilities and greater reputation, he ought to find that money himself. Perhaps that is more important in the graduate level than it is in the undergraduate level.

Mrs. GREEN. How would you administer a scholarship program on the basis that you are going to give him the amount that you said the Federal Government—although I notice it probably should be administered by the States—that the Federal Government thinks he is going to need to go to college in his geographical area?

Dr. WEST. There would have to be a State council which would examine the applications of every individual, particularly those who have ranked sufficiently high on the tests to be eligible for the scholarship. Then I think there would have to be studies of those people and their families, with the study of what the individual wishes to do, and then a determination of how much would be given to him.

Mrs. GREEN. You do not think that would add to the administrative cost?

Dr. WEST. Of course it would, but in relation to the total program of this size, those administrative costs in each State should not be high.

Mrs. GREEN. It seems to me that if we are really going to do a job in education, we need to forget State boundaries and lines and we need to forget the competition and jealousies between institutions and really go out after the youngsters of ability and see that they get an education.

That is all, Mr. Chairman.

Dr. WEST. Of course, there are other scholarships, like the merit scholarship plan.

Mr. ELLIOTT. Doctor, do you not feel also that the States ought to match whatever moneys are allocated for scholarships?

Dr. WEST. No; I would not say that absolutely. I think States should be encouraged to improve their own scholarship programs, but I doubt if we can say that they ought to match this.

Mr. ELLIOTT. Mr. McGovern?

Mr. MCGOVERN. Dr. West, I want to say first of all that I am very much gratified that the first witness to come before our committee in the 2d half of the 85th Congress has warned us against the dangers of a scholarship program that is directed to any one academic dis-

cipline. I think it would be an unsound educational procedure, and it would be dangerous politically for the Congress to sit in judgment as to what part of our educational program is entitled to assistance.

I certainly do not want to put myself in the position of the judge, as to who is more important to our survival, the chemist, or the teacher of history, or the preacher, or the journalist, or whoever it might be. I think you are certainly on sound ground in telling us here today that we need trained people in practically every area of knowledge.

It is true, as our very able and distinguished colleague pointed out a while ago, that right at the moment the American people are perhaps more concerned about the challenge of Soviet science and the sputnik than they are some other challenges, but tomorrow it may be the challenge of Soviet missionaries that are operating in the economic field, or the ideological field, or even in the field of fine arts.

I understand that there is real cause for alarm about the challenge that we are going to be confronted with at the Brussels Fine Arts and Cultural Fair that is ahead of us in a few months. We may have some embarrassing moments in that area. We may find that the challenge of Soviet science today is replaced by some other challenge tomorrow, so that I am very pleased that you have taken the approach that you have to this problem.

There is one question that has bothered be about a Federal scholarship program, and let me say that I am one of those that believes very strongly in some such program of assistance to our qualified students.

I know that you are aware of the fact that this country is undergoing a real population explosion and we are told that the enrollments in our colleges, with or without any additional scholarship assistance, may double or triple in the next 10 or 15 years.

Now, if we have further added to college enrollments by an ambitious scholarship program on the Federal level, what does this do to the already strained facilities of our colleges and universities? How are we going to handle this great explosion of college enrollment that is probably ahead of us in the next few years?

Dr. WEST. Mr. Chairman, Mr. McGovern, I think that is a real problem. Of course, I believe that many colleges are already taking steps to enlarge their plants to accommodate increased enrollments. Speaking individually, and from a hardboiled point of view of national interest, I think we will have to have better selective admission plans. Assuming that we had only a certain amount of spaces available, and we will have more without a doubt, but assuming we had only a certain amount, I think it is a little unfortunate that this half, 50 percent of the upper quarter, do not go to college, when there are many others probably in the lower half of their high-school classes who now do go to college, and whereas we believe in giving them opportunities, if it comes right down to a question of national interest and national survival, we may have to substitute and take in some of these more brilliant, more able people in place of some of those who are now in college.

Mr. MCGOVERN. There is another question that is closely related to that, Dr. West. I have been somewhat disturbed, and I know that you have and other educators have, about the quality of education

today. This, it seems to me, goes back to the problem of getting more and better qualified teachers.

In the report that was issued here a few weeks ago by the President's Committee on Education Beyond the High School, there was a very disturbing statement to the effect that at the present time college faculty members are paying for about half of the entire cost of education on the college level by accepting inadequate salaries.

Would you agree with that analysis of the problem?

Dr. WEST. Yes; I think that is true. The general level of wages in this country, I think since the early 1900's, have gone up about 6 times to most people in labor, industry, business, et cetera, whereas, college salaries in most places have done no more than double since 1910 to 1915, and there are many doctors of philosophy on college faculties now who are getting less than the plumber or the carpenter in the same institution.

Mr. MCGOVERN. There was a cartoon that appeared in the Washington Post today, Mr. Herblock's cartoon, that I thought was quite appropriate. It shows a citizen, or possibly a Congressman—I am not sure who this person was—but he was demanding more fruit from the educational tree.

The educational tree, unfortunately, was rooted in cracked, parched soil and there was a hostile climate, and this Congressman or whoever it might be was demanding that the educator suddenly produce a better quality student and forget about the tree, but give us more fruit. I am wondering if even the scholarship program of the kind that is outlined here will answer that problem.

Dr. WEST. It will not answer it completely, but I think that any program of this sort, when it is sponsored by the Federal Government, gives notice to the people that the Government believes in education, wants to advance education, and is willing to go a certain distance, at least, to experiment and begin work in this field.

Mr. MCGOVERN. The point that I am trying to make here, Dr. West, is that the bringing of more students to our colleges, even better qualified students, will not in itself prevent the loss of a great many well qualified teachers who have been leaving the profession, nor will it attract new qualified people to the field so that this is only one small part of the total problem that we are interested in.

Dr. WEST. That is correct, without any question.

Mr. MCGOVERN. There is one question about the administration of this program that concerns me. How do you determine the financial need of the student? Have standard tests been worked out in that field?

Dr. WEST. I think I said earlier that the Educational Testing Service at Princeton has been working on this for the last 5 or 6 years, and they now have, as perhaps some of you know, a sort of a pool, which is used by a large number of colleges to determine their own scholarship awards. The Educational Testing Service has developed considerable experience in questionnaires, finding out the resources of families. Then the application for scholarship is made directly to them. A number of colleges are now using that source instead of having individual applications to the college itself, so that there is not competition among the colleges for a person who may apply to 6 or 8 or 10 colleges.

I think the Eductaional Testing Service has been getting a considerable amount of experience, which will be sound in finding out how to determine the need of a student. Of course, England, as you know, has had a great deal of experience in this, and has gone to some lengths in awarding their stipends, according to need.

Mr. McGovern. That is all.

Mrs. Green. Would you yield?

Mr. McGovern. Yes.

Mrs. Green. Has your association taken any position on whether or not these scholarships might be used at private schools, as well as public schools?

Dr. West. Oh, yes; they are usable anywhere. In other words, the youngster who gets the scholarship may use it in any accredited institution. I think it is mentioned here that the institution must be accredited by a regional accrediting association.

As you probably know, there are six of those in the country covering the entire United States, and we have on the whole been averse in this country to national accrediting. We have felt that accrediting ought to be done by the regional associations themselves.

Mrs. Green. Thank you.

Mr. Elliott. The gentleman from Massachusetts, Mr. Nicholson.

Mr. Nicholson. How many State teachers' colleges do you have in New Jersey?

Dr. West. New Jersey? Six.

Mr. Nicholson. Is the tuition low?

Dr. West. Yes. Up to this last year, for the last 35 years it has been $100 a year. Prior to 1930 there was no tuition, on the general theory which I think existed in this country that it was the obligation of the State to give advantages to those people who were going into teaching, because salaries were low and it was felt they should have free tuition.

At the beginning of the depression we began to charge $100. Last September it went to $150 in New Jersey.

Mr. Nicholson. What relationship does that have with Rutgers or Princeton?

Dr. West. Rutgers' tuition, I think, is about $350.

Mr. Nicholson. Is that a State-supported college? Is that an agricultural college?

Dr. West. Rutgers is an old, private institution which has been named by the State as the State university, so that it gets its money partially from its own endowment funds and partially from the State, but from the standpoint of its government now, it is a State institution.

Mr. Nicholson. Do you have an agricultural college?

Dr. West. As a part of Rutgers; yes.

Mr. Nicholson. You speak about these higher-level students, the upper 10, or whatever you call them.

Dr. West. Upper 25 percent.

Mr. Nicholson. Lots of boys and girls have gone to college that never made it to the honor list in high school, and were lucky to get by in high schools. They made excellent students. Why should they be discriminated against because their marks were a little different in high school?

Dr. West. Well, of course, that is true. There are exceptions like that. I think our studies have shown, however, that there is a pretty

high correlation between accomplishment in high school and accomplishment in college.

Mr. NICHOLSON. I have an example of my own daughter. I do not believe she got better than "C" in high school, whatever "C" is.

Dr. WEST. I could match you with my own son. The same thing happened with him.

Mr. NICHOLSON. Now she has a master's degree from Smith. According to this classification, she probably would never have gotten in college, let alone get a master's degree under this proposition we have before us.

Dr. WEST. I do not believe from the standpoint of public policy, when you are dealing with people from a Government agency, that you can do anything else than base these things upon what we think of as pretty objective measures. Now, there are many other ways in which those people can get aid, and there are many colleges that can perhaps aid them better if we have a Federal scholarship program than they could without it, because the colleges would be relieved, you see, from spending some of their own money for these high-level students.

Mr. NICHOLSON. These colleges in New Jersey are distributed to take care of the population so that a girl can go near her home?

Dr. WEST. Yes. We have 4 in the northern section of the State where there is a very large concentration of population, 1 in the center, which is Trenton, and 1 in the southern area, Glassboro, so that any student is taken care of if that student wishes to live at home.

Mr. NICHOLSON. Of course, some States have a great deal to do with the education system in the cities and towns. Massachusetts does not have anything to do with the school situation.

Dr. WEST. I know. I grew up there.

Mr. NICHOLSON. You know more about it than I do, probably, but we do not have that system that they do in your State. You are leaving a great deal under these bills to the State.

Dr. WEST. Merely in the selection of the recipients of the scholarship and determination of the need.

Mr. NICHOLSON. We would have to pass State laws, I imagine.

Dr. WEST. You would have to accept a program of this kind, set up a council, and give it certain powers. But you have a State board of education now, and an organization.

Mr. NICHOLSON. Yes, but they are limited to what they can do. For 30 years we took $5 million from the income tax and distributed it to the schools. It paid over $1,000. That was the only interest other than what the Federal legislature passed on curriculum, as to the number of weeks they should go. That is all they had to do with it. The education is left entirely with the city and town, with the school committee, who are unpaid.

Dr. WEST. I do not think there is any conflict between that and the administration of a plan of this kind. In fact, if you believe in that system, and I know you do, you would assume that the graduates of your high schools would stand well and would be eligible for scholarships.

Mr. NICHOLSON. Of course, it is changed. When I graduated from high school, it was around the first year, when you could get admitted to colleges on your ecord in the high school. You didn't have to take any examination. Now I guess they are all admitted from every high school.

Dr. WEST. No. Many colleges have different kinds of examinations than they had years ago, but they have what we call a scholastic aptitude test, and in many colleges where there has to be a limitation of enrollment, as there has to be more in the private colleges than in the public colleges, that aptitude test is very important.

Mr. NICHOLSON. That is a matter that is decided by the college itself, is it not?

Dr. WEST. That is right.

Mr. NICHOLSON. Like MIT. They can make whatever rules they want to about admission of pupils.

Dr. WEST. You spoke of your daughter being a "C" student. I know a young man from Needham, Mass., who was a "C" student through high school, but he was so high in aptitude that he was taken by Harvard a few years ago. There is that case where the boy had natural ability but low marks. The scholarship program would not depend upon his marks in high school. It would depend upon his ability to pass an objective test.

Mr. ELLIOTT. The Subcommitte on Special Education is very happy to have an outstanding member of the full Committee on Education and Labor, in the person of the gentleman from Georgia, Mr. Landrum, visiting with us this morning.

Do you have any questions, Mr. Landrum?

Mr. LANDRUM. Not before Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. I yield.

Mr. LANDRUM. You are a member of the subcommittee, are you not?

Mr. FRELINGHUYSEN. Not the subcommittee.

Mr. LANDRUM. I would like to make one observation, Mr. Chairman. Dr. West, your primary mission as a State teachers' college is the training of teachers, is it not?

Dr. WEST. That is right.

Mr. LANDRUM. What percentage of your teachers go into the teaching profession?

Dr. WEST. In the past few years I think at least 90 percent.

Mr. LANDRUM. Can we say that the reason we are lagging behind in the development of engineers and scientists is the tragic shortage of qualified science teachers on the high-school level?

Dr. WEST. I think that is part of it, without any question.

Mr. LANDRUM. Then perhaps not your institution, but teachers' colleges in general, have they not overemphasized such things as the education courses and methodology and things of that nature, instead of preparing a person to go in and teach mathematics, or chemistry, or physics?

Dr. WEST. Well, in our institution, 75 percent of the work is content work, which you would find in any college, and 25 percent is in methods-and-practice teaching.

Mr. LANDRUM. Could you answer my question as to the general position?

Dr. WEST. Personally, I do not think that teachers' colleges and schools of education themselves have ever believed in that. They have been greatly misrepresented.

Mr. LANDRUM. Why have you devoted so much of your time and effort to requiring this for a professional rating of the teacher?

Dr. WEST. I do not think we have.

Mr. LANDRUM. I disagree with you violently.

Dr. WEST. All of the accrediting associations will accredit a school that has from 20 to 25 percent of its work in methodology and practice teaching.

Mr. LANDRUM. How much education, the courses in the field of education, do you require a teacher to have before you grant a professional certificate?

Dr. WEST. New Jersey now requires only 18 hours of work plus practice teaching which amounts to 6 hours; actually, 24 hours out of the usual college course of 128.

Mr. LANDRUM. That gives a professional certificate?

Dr. WEST. That is correct.

Mr. LANDRUM. Supposing you have a graduate with a major in chemistry who does not have this 18 hours of so-called education and goes into the teaching profession. Is he penalized in his salary because he does not have his 18 hours?

Dr. WEST. Not in New Jersey. As a matter of fact, now, with the present shortage of teachers, he can actually start teaching with 6 hours of work and then he can get some more as he continues his teaching.

Mr. LANDRUM. He is not penalized now. How long has that been in effect in New Jersey?

Dr. WEST. We have never penalized anybody in salary if he could get a position. Of course, the salary, as in Massachusetts, is controlled by local school boards, except that 2 years ago—this is the first time it has ever been done—the State legislature passed a minimum-salary schedule. But most communities, particularly the good communities, are above that schedule, anyway, so the teacher's salary is fixed by local rules, and I have never heard of anybody being penalized because he did not have the educational requirements, provided he could continue legally to go on to teach.

Mr. LANDRUM. You have never heard of that anywhere?

Dr. WEST. I do not know of it. If he is legally allowed to continue to teach, I would assume that he would share in the salary schedule.

Mr. LANDRUM. Do you require him to have a minimum of 6 hours of education before he can get a license to teach?

Dr. WEST. That is right. He must have 6 hours, but that 6 hours may be in such a general field as psychology, which many liberal-arts people would take, anyway.

Mr. LANDRUM. His beginning salary is the same, then, with 6 hours as the beginning salary of one with 18 hours of education?

Dr. WEST. That is right.

Mr. LANDRUM. And has that always been the case in New Jersey?

Dr. WEST. Well, of course, it is only recently that he has been allowed to teach with 6 hours, because the present shortage of teachers is such that those standards had to be reduced. When we had plenty of teachers, he was required to have more.

Mr. LANDRUM. I understand that. Why do you call those standards?

Dr. WEST. You mean the professional standards?

Mr. LANDRUM. Yes, sir.

Dr. WEST. They are the standards that have been in the rules of the State board of education for years.

Mr. LANDRUM. That is the very point I am trying to get at.

Dr. WEST. Of course, I would defend them as proper standards.

Mr. LANDRUM. Have we not been guilty—let us use the proper noun to apply to all of us—have we not been guilty of overemphasizing that?

Dr. WEST. I do not think so myself.

Mr. LANDRUM. You do not?

Dr. WEST. No.

Mr. LANDRUM. You would not say that is a prime reason for not having qualified teachers in the high school for science and physics and mathematics?

Dr. WEST. I do not think so. Of course, in our institutions we require a science major to have nearly half of his work in science and mathematics, in all of his 4 years. He must have about half of his work in science and mathematics.

Mr. LANDRUM. I am glad to know that you do that. Of course, I can see that as a result of it you may have a better than average mathematics or science program in your secondary schools. That is not the case when you take the statistics from about 32 States of this Union. You will find your educational organizations, such as your National Education Association and your State education associations, laying emphasis primarily on the attainment of the standards set up for the professional certicate, which in my opinion is a lot of trash, or hokum.

Mrs. GREEN. Would the gentleman from Georgia yield?

Mr. LANDRUM. I yield the floor.

Mrs. GREEN. I do not know what the requirements are in Georgia, but I thought perhaps sometimes the teachers on emergency schedules to not reflect the picture in the country. For example, in my State a person may move in from Georgia or from Kansas, be a college graduate, and have a teaching certificate from the State from which he came, but he has not had a couple of courses in Oregon law or Oregon history or some educational course that Oregon requires, and therefore he would be granted an emergency certificate.

Mr. LANDRUM. Are you doing that to our Georgia people in Oregon?

Mrs. GREEN. Of course, when Georgia people move to Oregon they never go back, but I am inclined to agree that we require too many educational courses. I have friends who have been out of the teaching profession for 10 years, college graduates. For instance, one I can think of wanted to teach history. She would be a wonderful history teacher. She was required to take 17 hours of education and psychology. She said, "To heck with it," and she went into another profession.

Dr. WEST. It is an old argument which we have not settled yet.

Mr. ELLIOTT. We are happy to have another member of the full committee who is not a member of the subcommittee but who has a very deep interest in these questions, the gentleman from New Jersey, Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman. It is pleasant to listen to a fellow New Jersian, Dr. West, and to welcome you before this committee as a witness. I would like to say in self-defense, perhaps one of the reasons I am not a member of this subcommittee is because I have been lucky enough to be a member of the Sub-

committee on General Education, whose major responsibility at the last session of Congress was to try to get a school construction bill through the House.

We failed. It is because we failed that I think that this subcommittee and the full committee must examine very closely whatever proposals are being made to cope with what we currently think of as the most urgent problems.

I have been very much interested in your testimony, and I hope you will not think that my questions are too critical. They are not meant for that at all. I just would like to bring our your philosophy a little bit more, and I will try not to take too much time.

Do you feel that one of the functions of a Federal scholarship program should be to encourage the further education of young people of exceptional ability?

Dr. WEST. Well, if you call this upper quarter exceptional, I would say "Yes." I think it ought to be one of the big functions of such a program to get into the colleges—particularly, to get them to go from high schools to the colleges—the people who cannot only serve themselves but serve the national interest by taking up this kind of work rather than something else.

Mr. FRELINGHUYSEN. That is exactly what I mean. Your main emphasis seems to have been on the need of a lot of people, rather than the ability.

Dr. WEST. I would not say that. We want to get these people of ability.

Mr. FRELINGHUYSEN. Your reference to ability is the fact that these students should be qualified. You feel strongly that what we should do is in some way to encourage those able ones, because they can eventually, we hope, serve the national interest?

Dr. WEST. That is right.

Mr. FRELINGHUYSEN. Again, Mr. McGovern talked about the quality of education as being one of the essential things we are trying to encourage. I think we all agree with that.

If that is the case, and if ability should be one of our criteria in establishing availability of scholarships, do you feel that there should be any obligation created on the recipients of the scholarships?

There has been a suggestion made that something comparable to our military academies should be done with any Federal scholarships; that if we provide Federal scholarships, there should be some kind of an obligation to discharge to the Government as the result of the receipt of that scholarship. Would you think that there would be any substance in that argument?

Dr. WEST. Of course if we accept the principle of the scholarship as being across the board, meaning that the young person can go into any kind of endeavor, it would be pretty impossible, it would seem to me, to ask him to sign any sort of obligation, because by the very acceptance of that philosophy we have really said that no matter what he goes into, whether science, technology, the humanties, the fine arts, he is going to be a better citizen in our whole democracy and make a better contribution because of doing that, and if you accept that philosophy, you could then hardly ask him to sign anything because you are assuming that everybody is contributing to the national defense, the national interest, doing something worthwhile in this college program.

Mr. FRELINGHUYSEN. Dr. West, that argument is far from settled at the moment, if we are going to argue that scholarships and other educational assistance should be supported in the form of specific legislation, because the national interest or the national security demands it.

It may well be that we will encourage certain fields of scholastic, academic activity, and not apply it across the board, and no matter what we think of as a general principle. I had the opportunity last night of hearing Dr. Killian make his first public speech. He talked about scientific illiteracy and he said the emphasis on certain areas, encouraging scientific education, is not necessarily a discrimination aganst other areas; it is simply a question of catching up with an important area which has been neglected.

I think we could certainly use that argument and say that there is an emergency upon us, and it is for that reason that, for the moment at least, Federal scholarships should be channeled primarly to encouraging a greater interest, and promoting the national welfare in science and mathematics and engineering and physics, and so forth. It is not necessarily a discrimination.

Dr. WEST. I am sure that would not be the opinion of the American Council, or of the replies that we have had from the institutions that have been interested enough to answer, and most of them have. They definitely believe in a scholarship program, which is across the board, noncategorical, and they believe that that will in itself probably encourage those who are able people in science and mathematics, engineering, and so forth, to go into those fields.

Mr. FRELINGHUYSEN. You have mentioned that this should be an undergraduate program only. I do not quite follow you.

Dr. WEST. The subject of undergraduate scholarships was the assignment of the Scholarship Subcommittee. As I said before, the Committee on Relationships of the American Council is even now studying a program of graduate fellowships, and trying to get ideas concerning that. A definite proposal will be made soon.

Mr. FRELINGHUYSEN. As I recall your testimony, you felt perhaps graduate programs could develop mathematicians and scientists and they could concentrate, but the undergraduate programs should not.

Dr. WEST. You have got to have a foundation in undergraduate work to go on to graduate work; there is no question about that. As I said before this, this guidance to go into college has got to start down as low as the seventh or eighth grade, in identifying people, identifying youngsters who are capable of going on.

Mr. FRELINGHUYSEN. The thing that worries me is if we do not try to hook any program to a national emergency, one that everybody can recognize and develop an interest in certain areas, that we are almost surely going to come across at least as great obstacles as the school construction bill faced, and perhaps even worse.

In other words, there was a feeling, whether justified or not, that although we can recognize there is a need for classrooms, and there is an argument for Federal assistance in the construction of classrooms, that we are not going to do anything about it. I, myself, regret to see that we are apparently going to take up other ways of approaching this basic problem, rather than the classroom, because you are surely going to run into this question of Federal control and undesirability of a massive injection of Federal assistance, whether it is 10,000 or

100,000 scholarships a year, unless you have got some pretty sound justifications for it.

It is for that reason I think we have got to explore pretty carefully how broad you want to be. Of course, lots of things would be good and would improve our educational system.

Dr. WEST. Of course, I think you will have much more justification for the objection to Federal control if you aid 1 or 2 fields like science and mathematics than you will if you aid across the board.

Mr. FRELINGHUYSEN. Naturally if we are to have more scientists there must be a greater interest on the part of our young people so as to develop future scientists. I think you have a better sales argument than if you say there are lots of people not being educated and it is the responsibility of the Federal Government to educate them.

Dr. WEST. You are speaking from the standpoint of a Congressman, which is perfectly proper.

Mr. FRELINGHUYSEN. It is a practical problem to face and I feel somewhat sensitive because we failed to do what I consider was to enable a very sensible program.

Mr. LANDRUM. Would you yield to me for one question?

Mr. FRELINGHUYSEN. I will be glad to yield.

Mr. LANDRUM. We recognize a tragic shortage of qualified teachers throughout the United States; do we not, Dr. West?

Dr. WEST. That is right.

Mr. LANDRUM. How would you feel about allowing the recipient of a scholarship the opportunity to discharge his obligation by devoting a minimum of years after graduation to teaching?

Dr. WEST. I think that would be very unfortunate.

Mr. LANDRUM. Why do you think so?

Dr. WEST. Because I do not think it would be wise to tie him to a particular field because he is receiving a Federal scholarship.

Mr. LANDRUM. A moment ago you agreed that the scholarship should be paid back.

Dr. WEST. No.

Mr. LANDRUM. Yes, you did.

Dr. WEST. We were talking about two things. We were talking about a loan scheme and a scholarship plan. I do not think anybody ever advocated that these scholarships should be paid back.

Mr. LANDRUM. You do not, then?

Dr. WEST. No.

Mr. LANDRUM. You feel that the recipient should have no obligation to the Government?

Dr. WEST. To the Government; that is right.

Mr. LANDRUM. How is he going to discharge it?

Dr. WEST. He is going to discharge it by being a much better citizen and making a greater contribution to our national welfare and interest.

Mr. LANDRUM. You have sawmillers who didn't finish the second grade doing that today.

Dr. WEST. But we need them in the upper levels. This is the time we need these able people to be well trained because of the problems that face the Government right now. We are not saying every citizen is not making his contribution. I think we are saying we should catch these abler people and give them the opportunity to make the contribution they could make if they are educated.

Mr. LANDRUM. Perhaps I worded my question wrong. I didn't mean to force the recipient in the teaching field. I mean giving them that opportunity.

Dr. WEST. I think that would probably get more people in the teaching field than are there now.

Mr. LANDRUM. Isn't that a problem?

Dr. WEST. Yes, it is.

Mr. LANDRUM. Thank you, Mr. Elliott.

Mr. ELLIOTT. Mrs. Green.

Mrs. GREEN. I just want to make one comment. I don't know if you will agree or not. I think sputnik has pointed out there is a crisis as far as scientists and engineers are concerned. Something that may happen 60 days or 6 months from now may indicate the Russians are ahead of us in other fields, too. While we need scientists and engineers, I think present indications clearly show we need some experts in government.

Mr. FRELINGHUYSEN. We might develop a Federal scholarship program for the politicians.

What I am really saying is that if we are going in for a broad program in this field, perhaps we need something that would be more pointed, more effective, more directly beneficial to the Nation than the GI bill. As beneficial as that was to many of our veterans, it seems to us their contribution to our Nation as the result of that was somewhat diffused, and I think there would be greater possibility of having legislation enacted if we had a general program.

I have mixed emotions about that. My own bill is a general program, but it authorizes the President to direct that the stipends should be to students in activities related to national defense. That would allow him to channel those scholarships in certain programs in accordance with the need.

Dr. WEST. Have you seen the report of the educational policies commission under President Wells of the University of Indiana issued in the last week or two?

Mr. FRELINGHUYSEN. I believe not.

Dr. WEST. That report points out the necessity of this general overall look at our educational system and its soundness in all areas rather than just in one.

Mr. FRELINGHUYSEN. I am scientifically illiterate myself, so I can stress the value of a general education, though I appreciate the necessity for scientists.

Mr. MCGOVERN. I am as interested as you are in the political strategy of getting a bill through Congress. There is an interesting sidelight. Some of the people who opposed this in the education bill in the last session of the 85th Congress did so because they felt it would be an opening wedge that might enable the Federal Government to put pressure on the administration of our school programs. When we enter into an area where we say Congress will determine what field will be supported, aren't we in effect aggravating the danger that our colleagues were concerned about?

Mr. FRELINGHUYSEN. That is why I think we should define very carefully the program we will suggest out of this comittee. To my mind the more effective way to develop those fruit trees that develop fruit would be to provide what is necessary so we can build buildings

and not get into the scholarship program, and not get into teachers' salaries, and not try to establish better curriculums. That is a field in which the Federal Government traditionally has said the basic responsibility is local.

Mrs. GREEN. Are we as a committee willing to compromise to the extent that each Congressman will appoint five?

Mr. FRELINGHUYSEN. That program does have some advantages.

One final point. You mentioned that the State should be encouraged to develop programs of their own, yet you sounded to me very cool to Mr. Elliott's suggestion that encouragement by the Federal Government could be in the form of requirements for matching any funds that the Federal Government might put up. Do you not think it is reasonable to try to oblige the States to take a more active stand than they presently do and say if money is available we will only contribute on condition they put up some money of their own.

Dr. WEST. I think that might be explored. That would mean you already had something like that in force and were willing to do more. Take New York State, which has a very good scholarship program. They may have as much now as the Federal Government would give them. If so, you wouldn't ask them to give more?

Mr. FRELINGHUYSEN. Perhaps it could be matched. Let us, for the sake of argument, say we would like to see $30 billion spent on education instead of $15 billion. We should not rely solely on the Federal Government, in my opinion, to make up the difference. We should try to keep the Federal share as low as possible.

Dr. WEST. I don't think that is out of the question. I don't want to be interpreted as saying that this is entirely out of the question.

Mr. FRELINGHUYSEN. Thank you.

Mr. ELLIOTT. Thank you, Dr. West. We appreciate your testimony, which has been very helpful.

As a parting shot, may I ask you to tell us where we coud get copies of the report you referred to that has recently been issued?

Dr. WEST. That was a report of the educational policies commission under President Wells of the University of Indiana, who is chairman. Copies are available and may be obtained through the NEA.

Mr. ELLIOTT. If we might have 30 copies we would appreciate it.

Dr. WEST. They may be obtained from the NEA.

Mr. ELLIOTT. The subcommittee will stand adjourned subject to the call of the Chair. It is my understanding the full committee meets tomorrow at 10 o'clock.

(Thereupon, at 12: 10 p. m., the hearing was adjourned.)

SCHOLARSHIP LOAN PROGRAM

MONDAY, FEBRUARY 3, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION OF THE
COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10 a. m. in room 429, Old House Office Building, Hon. Carl Elliott presiding.

Present: Representatives Barden (chairman), Elliott (chairman of the subcommittee), McGovern, Wainwright, and Nicholson.

Also present: Representatives Bailey, Perkins, Metcalf, Thompson, Udall, Gwinn, Kearns, Frelinghuysen, Haskell, and Lafore.

Staff members present: Fred G. Hussey, chief clerk; John O. Graham, minority clerk; Charles M. Ryan, general counsel; Kennedy W. Ward, assistant general counsel; Russell C. Derrickson, chief investigator; Mary P. Allen, subcommittee clerk; and Robert E. McCord, clerk, Subcommittee on General Education.

Mr. ELLIOTT. The Subcommittee on Special Education will be in order.

This subcommittee has invited the Subcommittee on General Education to sit with it throughout the remainder of the hearings on the legislative proposals relating to scholarships, fellowships, work-study programs, loans, aid for high-school science-teaching facilities, and many other items that are before the committee. We are glad to have the members of the Subcommittee on General Education with us in these hearings, and we trust that we may be able to push right along now and finish in about 6 weeks.

We began the consideration of these proposals, in general, last August and held hearings last fall in four of the Western States, also we had a hearing in January of this year.

The committee, however, will not be in session tomorrow. After today it will resume its sitting on Wednesday.

I would like to say that we are very happy to have the chairman of the full committee, the Honorable Graham A. Barden, of North Carolina, sit with us this morning, and I would like to say to you, Mr. Chairman, I would feel better if you would take the chair and preside over this meeting.

Mr. BARDEN. No, sir. I am already feeling more comfortable right now. Thank you very much. I appreciate it.

Mr. ELLIOTT. We are mighty happy to have you and I would like to say that we are happy to have any other member of our full committee sit with us at any time, or any other Member of Congress that may care to do so.

We are happy to have as our first witness today the Honorable Marion B. Folsom, Secretary of Health, Education, and Welfare. Mr. Folsom is accompanied by Mr. Perkins, and Mr. Richardson, and Commissioner of Education Lawrence G. Derthick.

I would like to say to you, Mr. Secretary, that you may proceed in any manner that you see fit. I believe the members of the committee have been furnished with a copy of your proposed statement. You may read it, or summarize it, or however you may care to proceed.

Mr. Secretary, would you object to an occasional interruption as you read your statement, or would you rather finish it before questions?

STATEMENT OF HON. MARION B. FOLSOM, SECRETARY, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, ACCOMPANIED BY JOHN A. PERKINS, UNDER SECRETARY; ELLIOT RICHARDSON, ASSISTANT SECRETARY; AND LAWRENCE G. DERTHICK, COMMISSIONER OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Secretary FOLSOM. I would prefer, if it is agreeable to you, to read my statement through and then answer questions afterward.

Mr. ELLIOTT. You may proceed.

Secretary FOLSOM. Mr. Chairman and members of the committee, I am grateful for the opportunity to appear before these subcommittees of the House Committee on Education and Labor. Your long-standing interest in American education is shared by the Department of Health, Education, and Welfare.

As you know, the President has urged prompt Federal action to help strengthen education in areas of special importance to the national interest and the national security. These recommendations have been introduced for the consideration of the House in H. R. 10278 by Representative Kearns and H. R. 10279 by Representative Frelinghuysen.

I might say for my part I would like to discuss some of the broad basic considerations which will determine the general nature of this program and then after you are through with the questioning I would like to have you call upon Commissioner Derthick, who, as you know, has had a long career in the public-school systems, to present a careful description of the bill and he will give his views on the expected effect of different aspects of this bill on the public-school systems.

Then we also have Dr. Perkins, who is on leave as president of the University of Delaware, has been there for several years, and has had also extensive experience in higher education, and Mr. Richardson is present to answer any questions that might arise after Commissioner Derthick has presented his statement.

The national interest in education has been demonstrated throughout our history. As early as 1787 the Continental Congress, in setting aside certain lands for educational purposes, expressed the national interest in education with this historic declaration:

> * * * knowledge being necessary to good government and the happiness of mankind, schools, and the maintenance of education shall be forever encouraged.

The beginning of Federal aid to land-grant colleges nearly a century ago, under the leadership of Abraham Lincoln, and the inauguration of the vocational education program some 40 years ago, are classic expressions of an active Federal interest in education in their time.

The program now recommended to the Congress by the President reflects the current national interest in education. These proposals represent a great deal of study and thinking by an impressive number of people over a period of many months. We have had the benefit of studies by committees of the Congress, including the hearings by your committee, the White House Conference on Education, and other groups.

Last summer I appointed a special task force within the Department particularly to appraise the recommendations of the President's Committee on Education Beyond the High School. During the fall and winter officials in the Office of Education and in the Department conferred with scores of leading educators and scientists. Within the Federal Government, we have had close and valuable consultation with Dr. Alan T. Waterman of the National Science Foundation and Dr. James R. Killian, the President's scientific adviser.

This program thus stems from a matured recognition of a clear truth which the American people can never afford to forget: The ability of this country to survive in a world where freedom is imperiled may depend largely upon the strength of American education.

Though the national interest in education is now heightened by threats to the security of all the people, the Federal action in education is limited by important and fundamental considerations. We must, for example, avoid the pitfall of nationally controlled education—of rigid uniformity which would destroy the diversity, independence, and freedom that have been hallmarks of American education.

We must not make local schools and independent institutions dependent upon the Federal Government for massive and all-embracing support; this would dampen the local initiative and private enterprise which have contributed notably to American education.

Our proposals, therefore, are developed from the basic premise that education is, and must remain, primarily a local, State, and private responsibility. The Federal role is to encourage and assist—not to control or supplant—local and private effort. It is a role of leadership in pointing to critical national needs and in offering incentives for greater local, State, and private efforts to meet these needs. In this way we serve both the interests of the people as a whole, and the interests of the people as individuals and as citizens in their local communities.

I would like to emphasize one further general point. It is important, yes, that the Federal role be constructive and prudent within these general bounds. But it is also vitally important that progress in meeting critical national needs in education should not be stifled and thwarted by blind and unreasoned fear of any Federal action in education whatsoever.

In the land-grant college program, in vocational education, in aid to veterans' education, and in other programs it has been proved repeatedly—beyond reasonable doubt—that the Federal Government can respond to specific national needs in education without Federal control or domination. Surely the Federal Government would be derelict, in today's circumstances, to stand idly by, taking a know-nothing, do-nothing attitude toward the national-security aspects of education.

The administration's proposals, therefore, are designed as a temporary program to serve as a stimulus in helping our educational system meet certain national security needs more quickly and more fully. The Federal funds proposed here, coupled with a related expansion in educational activities of the National Science Foundation, would amount to about $255 million the first year and roughly $1 billion over the next 4 years. These programs deal with focal areas in education and high priority needs of our times; while they would yield far-reaching benefits, they would, of course, be a relatively small part of total public and private expenditures for education, now running about $16 billion annually.

The program deals specifically with five important problems.

1. The waste of needed talent: The failure of large numbers of our ablest youth to pursue their educational opportunities is a shortcoming in American education which critically affects the national interest and national security. Various studies have shown repeatedly that, each year, many young people with great potential ability either drop out of high school before graduation or, after graduation, don't go on to college.

Estimates are that each year some 200,000 or so young people with high ranking in their classes are lost to advanced education in this way. These studies—which will be reported in some detail in later testimony—demonstrate convincingly that the Nation is failing to develop its human resources as it might and as it must in these times of trial. The need for highly trained manpower, not just to advance scientific research, but to man our commerce and industry, to staff our schools and to fill our public offices, grows greater with each step forward into the complex world of tomorrow. This is a national need. It is a problem which requires a national perspective and a nationwide effort. It would be unrealistic to expect each local school district in America to act to meet this national need as fully and as promptly as today's circumstances require.

It is, in our view, a responsibility of the Federal Government to direct vigorous attention to such national problems, and to provide incentives to meet the challenge they present. Our proposals would reduce the waste of needed talent by encouraging earlier and better identification of potential abilities and improved counseling in the development of these abilities, and by providing Federal scholarships as a further incentive to the ablest students who need financial help.

A. Early identification of abilities: Our program would provide 50–50 matching funds to the States to encourage improved and more systematic testing to identify the abilities and aptitudes of students at an earlier stage in their education. The testing devices to be used, and the precise manner and time of testing, would be determined by the responsible State and local authorities. This would preserve and strengthen that autonomy which is the key to long-term educational vitality. It would encourage practices best suited to local needs.

A number of studies have shown that testing for aptitudes and potential abilities, in addition to the regular measurements of achievement in the classroom through grades alone, can be very valuable in guiding students into the educational activities best suited to the full development of their capacities. And yet such testing systems are now spotty and inadequate in many areas.

The proposed Federal grants also could be used to help States and local school systems maintain better cumulative records on their students. Such records also are very important in the identification of potential abilities.

B. Improved counseling: Early identification of potential talents yields full benefits to the student and to society only when this information is put to use in assisting the student in selecting courses of study best suited to his real interests and abilities. It has been demonstrated that skilled counseling services can help students develop their capacities more fully. Through these services able students can be encouraged to remain in school, to work harder in basic academic courses, and to prepare for college.

An experimental study in New York State showed that 27 percent of the students who had the benefit of counseling service made honor grades, while only 10 percent made honor grades in a selected similar group which received no organized counseling. Further, 53 percent of the students with counseling services went on to college, while only 35.6 percent of those without counseling services sought a higher education.

Despite the obvious benefits of good counseling, today there is a serious shortage of skilled counselors. Our colleges are graduating only about half as many counselors as local schools are requesting. And only about one-third of the counselors now employed meet the professional standards that most States have established. Many regular classroom teachers could also benefit from training in counseling and guidance.

The administration's proposals, therefore, provide funds to the States on a 50–50 matching basis, for the strengthening and improvement of State and local school guidance programs, according to general plans worked out by each State. These funds could be used to help employ additional counselors, to give training in skilled counseling, and related purposes.

We believe that this program for the early identification and more effective counseling of able youth will do much to reduce the Nation's appalling waste of human talent. We recognize, however, that even though these proposals go straight to the heart of the dropout problem, they must be accompanied by a further provision. Many of the able youth now being lost to education, and who would be identified and encouraged to further education under this program, will face a serious financial obstacle to their higher education. Therefore, to encourage these youngsters to make the most of themselves, we have recommended the provision of some 10,000 new Federal scholarships a year for 4 years, to help get able students past this basic obstacle to their higher education.

The scholarships would be awarded on the basis of need and merit by State scholarship commissions. In making the awards, preference would be given to students with good high-school preparation in, or aptitude for, science and mathematics. Students would be free to choose their own course of study and their own higher educational institution.

In determining the proposed level of Federal funds for scholarship, we have given careful consideration to two factors. We believe it is important to provide enough scholarships so that the ablest students who need help will feel that they have a real chance to get

it; but we believe it is also important that the number of Federal scholarships should not be so large as to discourage increased assistance from State, local, and private sources. The Federal program, in fact, should serve as a stimulus; the testing and counseling phases would help identify deserving students and demonstrate the need for expanded local and private aid.

2. More and better teaching of science and mathematics: The second major problem to which the administration's proposals are directed is the need to expand and improve the teaching of science and mathematics in the Nation's public schools.

This is a compelling requirement of national security today. In many ways the need for action in these fields now is similar to the need for action to provide a stimulus to training in trades, industry, and agriculture 40 years ago. The enactment of the Vocational Education Act during World War I, in response to that need, sets the pattern for the proposed action now.

In his historic speech at Oklahoma City last November, President Eisenhower described our needs in science and engineering as follows:

> The Soviet Union now has—in the combined category of scientists and engineers—a greater number than the United States. And it is producing graduates in these fields at a much faster rate.
>
> Recent studies of the educational standards of the Soviet Union show that this gain in quantity can no longer be considered offset by lack of quality.
>
> This trend is disturbing. Indeed according to my scientific advisers, this is for the American people the most critical problem of all.
>
> My scientific advisers place this problem above all other immediate tasks of producing missiles, of developing new techniques in the armed services. We need scientists in the 10 years ahead. They say we need them by thousands more than we are now presently planning to have.
>
> The Federal Government can deal with only part of this difficulty, but it must and will do its part. * * *

The interest of the Nation in science and its essential base, mathematics, has, of course, been greatly stimulated in recent months by reports of technological and scientific progress in the Soviet Union, as well as by reports of the strong emphasis given to science and mathematics in Soviet schools. The Russians report that graduates of their 10-year school system—and they report 1½ million graduates in 1956—had 5 to 6 times the hours of require instruction in math and science as are generally required in many American schools.

Our efforts in the teaching of science and mathematics, however, should be governed by our own needs and not by an effort to imitate the U. S. S. R. While some schools offer good instruction in these fields, it is clear that on the whole we are failing to keep pace, not only with the need for more professional scientists and engineers, but with the increasing importance of science and technology to our whole society. Basic courses in science are more and more essential to a well-rounded education for today's world, regardless of the career pursued. Let me cite a few indications of our neglect:

There is a serious shortage of science and mathematics teachers. A study of teachers in three States indicated that only about one-third of those teaching science and mathematics had majored in those subjects in college.

And yet, of the men and women prepared to teach science and mathematics, only about 6 out of 10 go directly into teaching. Jobs in private industry pay more and offer greater incentives.

Only about 1 out of 3 of our high-school graduates have taken chemistry; only 1 out of 4, physics; 1 out of 3, intermediate algebra; and 1 out of 8, trigonometry or solid geometry.

In 1956 about 100,000 seniors were in public high schools which offered no advanced mathematics of any kind. About 61,000 were in schools that offered neither chemistry nor physics.

Laboratory facilities, library materials, and other equipment are often out of date or otherwise inadequate.

The administration's proposals, therefore, include matching grants to the States to encourage and assist State and local action to expand and improve the teaching of science and mathematics in the public schools. This phase of the program would require the bulk of the proposed funds—$110 million out of $145 million proposed for this Department in the first year of the 4-year program. As in other phases of our program, State and local authorities would have broad freedom to determine the specific methods of action best suited to State and local needs.

Part of the funds—$10 million the first year—would be available for strengthening the overall State leadership in these fields, much as effective State leadership has been achieved under the vocational educational program. I am advised by the Office of Education that while every State has one or more full-time supervisors in each of the various fields of vocational education, only 2 have them in mathematics, only 6 in science, and 2 in the combined field of science and math. This is a key need, because the provision of supervisory personnel in each State would provide badly needed leadership and consultation in helping local systems develop a modern curriculum, improve teaching, plan for better materials and equipment, and meet other needs.

The major part of the funds under this phase of our program—$100 million the first year—would be provided for use by the local school systems. These funds could be used to help local schools hire additional qualified science and math teachers, purchase up-to-date laboratory equipment and other materials, increase the pay of qualified science and mathematics teachers, or for related purposes. The States and the local schools would decide how best to invest these funds according to their own needs and methods of operation.

3. More college teachers: A third feature of our program would be directed toward still another acute problem—the need for more well-trained college teachers. College teachers are the very foundation of our entire educational system. They train the teachers at all levels of education, the scientists, and the leaders in many other fields upon whom our future prosperity and national security depend. The President's Committee on Education Beyond the High School has identified the need for more qualified college teachers as the most critical single need facing higher education. The Committee estimated that a net addition of 180,000 to 270,000 college teachers will be needed within the next 12 years. And yet, of the 9,000 students awarded doctor of philosophy degrees in our graduate schools every year, no more than 3,500 are available as new college teachers.

In 1955 and 1956 only about 1 out of 4 persons receiving a doctorate in chemistry and engineering entered educational service. The proportion of new full-time college teachers who had doctor of philosophy degrees dropped from 31 percent in 1953–54 to only 23 percent last year.

A relatively small number of institutions—about 160—provided the advanced education desired in a college teacher and among these a mere handful, 10, produce some 36 percent of our doctoral degree recipients. As the demand for additional teachers becomes more acute, many of these graduate schools will need to expand their facilities and their enrollments.

There is in the training of college teachers, as in defense production, the critical problem of lead time, and we must encourage expansion of graduate schools now in order to have teachers when they are most needed.

Hence we are recommending aid to graduate schools to encourage them to expand their output of future college teachers. Matching grants would be made up to $125,000 a year to these schools to help them employ additional faculty, increase salaries to reflect added responsibilities, or purchase needed equipment and other materials.

In addition, Federal funds would be made available to graduate schools for fellowships to help able college graduates prepare for college teaching careers. Because college teachers are needed in all fields, no restrictions would be placed on areas of study. Following the sound policy of building on strength, all established graduate schools would be eligible for such aid, and it is to be expected that many of our smaller graduate schools would be enabled with this assistance to establish larger and more effective programs and contribute more substantially toward meeting a critical national need.

4. Foreign language development: One of the most demonstrable areas of national interest in education, and one which is considered by many educators as a most critical weakness in our schools, is the field of modern languages. In addition to their value as a sound academic subject, the modern foreign languages offer to their students a means of improved communication in a rapidly shrinking world; to the Nation, widespread foreign language competence offers a means of better international understanding and friendship, and to the Federal Government, this competence means more effective representation abroad, both through informal, person-to-person diplomacy, and through a variety of governmental activities. Though some 3 million Americans are now living, traveling, or working abroad each year, we find ourselves the most backward major nation in the world in the vital field of language competence.

Whereas a Russian youth must study a foreign language for 6 of his 10 school years, foreign languages are seldom offered in American elementary schools and only about 15 percent of our high-school students are studying foreign languages.

To arrest the alarming decline of language competence in America, we have proposed an approach similar to that of the National Science Foundation in its field of concern. We would urge the establishment of training institutes by colleges and universities for teachers of the modern foreign languages. In these institutes, teachers could be made familiar with the wide variety of new approaches and techniques in the teaching of language, thus preparing them to offer more appealing and effective instruction to the youth of the Nation. Such efforts, we are confident, would lead to a reawakening of student interest in languages.

The Nation is also in urgent need of more—and more effective—facilities for training in those languages which are rarely studied in the United States but which are in wide use in the countries of Africa and Asia—countries whose good will is of vast and increasing importance to the United States. For instance, there are languages, spoken in countries with populations in the millions, countries where the United States has military, economic, and diplomatic missions, in which no instruction whatsoever is available in the United States. To repair this appalling deficiency and to increase competence in rarely taught languages we would propose the creation of a small number of special training centers in universities to give instruction in languages which are very important today but which are sadly neglected in this country. To such centers would go not only prospective teachers but also Government employees and others who need language training in order to become fully effective representatives abroad.

5. More and better information on education: The fifth and final feature of this bill would provide for the strengthening of State departments of education in the important work of gathering information about the status of American education. To assemble reliable statistical data on American education was the historical first purpose of our Office of Education. And yet State agencies are often fully occupied in keeping data on their schools for their own purposes, and they can only with difficulty and added expenditures of time and effort reply to requests for nationally needed information.

Since it becomes increasingly important for us to obtain such nationally needed data, and since it would be an unsound approach for a Federal agency to try to compile, itself, statistics within each State, we are recommending matching grants to the States to encourage urgently needed expansion and improvement of their statistical services. This is an area in which the Federal Government has both a large stake and a large responsibility.

From this outline of the President's proposals, I am sure it is clear to you that certain basic principles have been scrupulously observed. Above all, we have tried to do the right thing in the right way. We propose for American education certain steps urgently dictated by the national interest; but we propose to take them in such a way as to strengthen rather than weaken the principle of State and local responsibility. We do not propose that the Federal Government undertake the whole job of meeting deficiencies in education, or even the major part of the job; but we are deeply convinced that the Federal Government should encourage and support State, local, and private efforts to do a job that is and must remain their principal responsibility.

The struggle for good schools is an eternal one. It is as long and as difficult as the struggle for human betterment in all areas of life. And it is a struggle in which, in a democracy, no less than the forces of all the people are needed in all the States and school districts across the country. When the people cease to worry about their schools, they shall have lost their schools. It is the individual citizen who will ultimately win or lose the struggle for better schools.

But in considering this, we do well to remember the power, the value, and the importance of leadership. This is why we believe that as we in the Federal Government ask the American people to make the

sacrifices required for better education, we owe them the testimony of our active presence in the thick of that effort.

In conclusion, I quote President Eisenhower's message to Congress on education:

> This emergency program stems from national need, and its fruits will bear directly on national security. The method of accomplishment is sound: the keystone is State, local, and private effort; the Federal role is to assist, not to control or supplant, those efforts.
>
> The administration urges prompt enactment of these recommendations in the essential interest of national security.

Thank you very much.

Mr. ELLIOTT. Thank you, Mr. Secretary.

I have 2 or 3 questions that I would like to propound.

Mr. Secretary, I note that you say that the scholarships which you propose will be based upon need.

Secretary FOLSOM. Yes, sir.

Mr. ELLIOTT. How do you propose that the assessment of the need be made?

Secretary FOLSOM. We plan to leave that entirely to the States to determine. We will allot the scholarships to the States and they in turn will make the selection based on ability and need, and the State will set up either a State scholarship commission or they will use existing State organizations like the board of regents or whatever organization they have in the State for supervising the school systems. They will set up their own standards and determine it themselves.

Mr. ELLIOTT. The States will evolve their own standards by which need will be assessed with respect to these scholarships?

Secretary FOLSOM. They will submit to us a general plan showing how they are meeting this, but as long as it is a reasonable plan we would go along with it.

Mr. ELLIOTT. Secondly, Mr. Secretary, where did you get this figure of 10,000? Tell us how you arrived at that number.

Secretary FOLSOM. We have figures as to what scholarships are now available of course throughout the country and we, as I pointed out in the statement, did not want to have a massive scholarship program because we didn't want to discourage the scholarships which are now available. We thought that there was a great opportunity for more private companies and individuals, local communities, and institutions to do more in this field, so we didn't want to have too big a program and discourage that.

At the same time, we wanted to give some integrity to our counseling and guidance services too if we got a youngster up to the point where he might not otherwise have been interested in going to college, the point where he was all ready to go and then didn't have any funds available, we could fall back on this Federal scholarship.

We thought we ought to have some scholarship program so it was more or less after a weighing of those factors that we decided on this figure of 10,000.

I can't say it is exactly right, but it is our best judgment.

Mr. ELLIOTT. The 10,000 figure is your best judgment for this program?

Secretary FOLSOM. That is 10,000 for a 4-year period, so in the fourth year there would be 40,000 students receiving scholarships.

Mr. ELLIOTT. In the course of the 4-year period under this program you would train a total of 40,000?

Secretary FOLSOM. 40,000 would be the maximum.

Mr. ELLIOTT. 40,000 would be the total under the program that you propose?

Secretary FOLSOM. You would get 40,000 individuals.

Mr. ELLIOTT. Do we have any figures, Mr. Secretary—or maybe Mr. Perkins or Mr. Richardson might have some figures on this—as to the number of people of high ability, we will say in the upper quarter, who finish high school who have not gone to college as of a very late year?

Secretary FOLSOM. Yes. The figures are indicated here. The total figure I use of 200,000 represented those who do not finish high school, and also those who finish high school and do not go on to college.

We don't have the exact figures. A number of studies have been made, though, from various samples and Mr. Derthick is going to explain that in more detail. He will go into the basis upon which we arrive at that figure of 200,000.

Mr. ELLIOTT. Here is what I am driving at, Mr. Secretary. It seems to me under the proposal that you make that we are going to have many students about equally qualified perhaps as to educational attainments and probably as to need for a very few scholarships.

Of course I understand you allow the States to select the particular individuals who are going to be lucky enough to get a scholarship, but it is going to be awfully hard on the States to select 1 man out of 4 equally qualified as to education and need, and desire for education, to fulfill the particular scholarships that may be available.

Secretary FOLSOM. We had in mind that the amount of the scholarship will vary in accordance with need and we have assumed an average of $750, I think, or $800 per scholarship. If the State finds that the present scholarships are a much lower average than that, the State might award Federal scholarships with a somewhat lower average amount. If so, the scholarships generally being given, there would be more scholarships available in that particular State.

Mr. ELLIOTT. One of the big reasons I think why these scholarships are not being taken—and you see a lot of it in the papers these days, by people who say, "We have scholarships but they are not being used"—is the fact that those scholarships are so small.

Secretary FOLSOM. I agree with you and that is why we propose a maximum of $1,000, but an average of between $750 and $800. We are hoping, of course, as I said before, that this will stimulate the people who now have scholarship programs to increase the amount of their scholarships.

I think the average now is about $375, or something like that. There are very few of them over $375. The average is less than that.

We would encourage those people, corporations, individuals, and institutions, to increase the amount of their scholarships and also get more people interested in giving scholarships.

Mr. ELLIOTT. If it costs $1,500 to go to school a year—and I think that is pretty close to the average these days—a $200 scholarship isn't a great deal of help, is it?

Secretary FOLSOM. No. That is why probably some of these scholarships are not being used and why they don't help as much as they should. We are not assuming in our plan that we are going to take

care of the full cost of it. We expect the individual to contribute toward this, either his family or he contribute by working in summers or working during school or something of that sort. We think the individual should have an equity in his education himself and not dependent entirely on a scholarship.

Mr. ELLIOTT. I wonder why you didn't recommend a system of loans to supplement your scholarship idea.

Secretary FOLSOM. We considered that, and I might say, Mr. Chairman, that in getting up this program we got 4 or 5 tentative programs based on all the studies we made of the various conferences and everything, and then we discussed this program with many, many educators over the country, all levels of the educational system, and put these tentative programs up to them and got their criticisms, and advice and suggestions, and we finally came up with this program here.

We don't say it is the final answer, by any means. It is simply our best judgment after talking with many, many people on the various aspects of it.

We considered the loan proposal and we adopted the scholarship instead for 2 or 3 particular reasons. In the first place, we wanted to have a scholarship based on ability. Our problem as far as national security is concerned is to get these able youngsters into college. I might say parenthetically that the scientists agree with us that it is better to have an across-the-board scholarship and not just have it directed to mathematics and science, because they say, "If we get these youngsters into college, we will get our share of science and mathematics people," so the main thing to do is to get the youngsters into college. We can do that in a scholarship program. In a loan program it is rather difficult to make loans otherwise than to everybody across the board.

This is not a plan to greatly increase the number of people in college. It is directed mainly to get these able youngsters into college. Also the scholarship will give the person more incentive as we go along.

These youngsters we are trying to hold who are now dropping out will be given much more incentive if they know they have a chance at a scholarship rather than just to obtain a loan. Also the loans can be repaid easily by people if they go into certain occupations, but not in others.

I happened to be a member of the board of overseers at Harvard for several years, ending last June, and I was very much interested in their discussion of loans and scholarships between the different departments. The Business School and the Law School have loan funds and no scholarship funds because they expect their people to make enough when they get out to pay them off in a reasonable time, but when it comes to the graduate school of arts and sciences, the people going into teaching primarily, they say loans are not much value to them because the people when they get through don't make enough to pay off the loans. You have that factor involved, the occupation the man is going to get into. On balance we decided that the scholarship proposal had a higher priority than loans.

Also some States like Massachusetts are already setting up loan funds. There is no reason why States can't do that themselves or local communities can't do it. We don't see why the Federal Government should get into the picture if there is a good chance that States and local communities might do it themselves.

A boy also might have easily gone to a bank or to some friends and borrowed without having to go to the Federal Government to do it.

Mr. ELLIOTT. Of course you run into this proposition when you deal with banks: You run into the proposition of very short-term loans, and it seems to me that a student doesn't need anything less than he needs a loan repayable in 3 months or 6 months.

Secretary FOLSOM. I don't think the bank possibility is so great, but I do think there is a great possibility in the development of these plans such as Massachusetts is starting for making long-term loans to students. Also there are many loan funds in many institutions and colleges over the country which are not being used extensively. You will find quite a few. In fact, I was talking to the dean of a large university just the other day, who said that they increased their tuition and expected to get a big call for loans and they didn't have any additional calls at all for the loans, so I don't think the loans serve as an incentive and would do the job that we are looking for nearly as well as scholarships.

Mr. WAINWRIGHT. Would you yield?

Mr. ELLIOTT. Yes.

Mr. WAINWRIGHT. Would you care to say something about one of the principal objections, and that is the fact that coeducationally women are not going to borrow, which apparently was one of the considerations that played quite heavily in your thinking.

Secretary FOLSOM. Yes; I think that was a factor.

Mr. HASKELL. Will the gentleman yield?

Mr. ELLIOTT. Yes, sir.

Mr. HASKELL. The only negative factor that I heard you mention on the loan was ability. If you are going to limit your scholarships on the basis of ability you could limit your loans on the basis of ability. You are just assuming that this is impractical politically?

Secretary FOLSOM. I think it would be rather difficult.

Mr. HASKELL. I mean you could still slant your loan program in the same way you slant the scholarship program.

Secretary FOLSOM. It is also the ability to pay it off, too. It would be pretty hard to expect the people going into the teaching profession to pay it off as quickly as a man going into business or law.

Mr. HASKELL. It is a question of whether the Federal Government pays for the scholarship or whether the person who, having been motivated, say, under your guidance program and identification program, and really knew that he needed it to get a college education, wanted it. He could if he had enough gumption go out and borrow the money and pay it back at a later date. What is wrong with making that available, even if there are less desirable factors than in other things? Why couldn't it be fitted into our program?

Secretary FOLSOM. It could, and I won't argue that it couldn't, be fitted in. I was just saying we gave higher priority to the scholarships than we did to the loans for the reasons I have indicated, but I don't think it is as clear there what the national interest is as it is in the case of a scholarship.

Mr. NICHOLSON. Mr. Chairman.

Mr. ELLIOTT. Mr. Nicholson.

Mr. NICHOLSON. Isn't mathematics required in the schools throughout the Nation? Isn't it a required subject from the time they enter until they get out of high school?

Secretary FOLSOM. In some States it is not required. I think most schools do require it, but they don't require it in the higher math. They require it in the lower grades.

Mr. NICHOLSON. You have to have the groundwork for mathematics if you go to college. Where do you get that if it isn't required in the schools?

Secretary FOLSOM. You don't have to.

Mr. NICHOLSON. You are required to have 20 points or something to get a high school diploma, so what are these things that are required?

Secretary FOLSOM. Mr. Derthick can go into that, and Mr. Perkins, but we do know that they don't require the higher mathematics, which essentially is the basis for a person going into science.

Mr. NICHOLSON. Has the educational system fallen down? When I graduated from high school over 50 years ago these things were required—history, and English, and physics, and chemistry, and mathematics.

Secretary FOLSOM. Of course many of these things are given but they are not required, and also there are many optional courses, and you must realize we have a much higher percentage of population in high school now than we used to have, and so many of them are not interested in preparing for college.

Mr. NICHOLSON. We have been told all the time that Russia is very much superior to us in their educational system. Maybe they are, but what have they discovered from science and 101 other things that this country has not produced in the last hundred years? What have they produced that is superior to what we have?

Secretary FOLSOM. We don't admit that their educational system is better than ours, not by any means. We say that they are making tremendous progress in recent years in the technological and scientific fields and they are graduating many qualified scientists, and scientists of high quality, and engineers, as demonstrated by a number of things they are doing right now, and they are proceeding at a very rapid rate. That is a factor for us to consider in this country.

Mr. NICHOLSON. The reason we have this before us is to keep up with Russia, I guess.

Secretary FOLSOM. It is to improve our educational system to the point we think necessary for the national security. We think it is necessary whether Russia is there or not, but the great growth in the Russian technological and scientific field is certainly a factor we must keep in mind always.

Mr. THOMPSON. Mr. Chairman.

Would you yield?

Mr. NICHOLSON. Yes.

Mr. THOMPSON. I thought the Secretary might be interested in a quotation of January 8, 1790, 167 years ago.

There is nothing which can better deserve our patronage than the promotion of science and literature. Whether this desirable objective will be best promoted by affording aids to seminaries of learning already established, by institution of a national university, or by other expedience will be worthy of a place in the deliberations of the legislature.

George Washington said that in his first annual state of the Union message in 1790. We are a little late, but I am glad to see you here today.

I just have one question for the Secretary: I wonder what difficulties, Mr. Secretary, are going to be presented by the fact that these moneys for scholarships and for guidance, and so on, are loaned on a matching basis to the States.

As you know, some State constitutions prohibit the allocation of any moneys to parochial schools. The business of the separation of religion and the state is of course well known, but there are literally hundreds of thousands of children in parochial schools of various denominations and I wonder how they are going to be able to take advantage in any way of these testing, and guidance, and counseling services. This disturbs me.

Secretary FOLSOM. As far as the testing is concerned, that is a concern with the individuals and we feel that where a State has a provision which will prevent the State from testing an individual in private schools we can make arrangements with the Commissioner of Education to administer to those States on a basic comparable to the tests being administered by the States to the public school students.

When it comes to the actual counseling and guidance matching, there we're handling it as a grant to the State through the public schools and it would be difficult for us to do that for the private schools.

On the other hand, the scholarships of course will be available to the graduates of any school. That would be a statewide competition.

Mr. THOMPSON. And so would your teaching aid.

Secretary FOLSOM. And also the aid to the graduate schools.

Mr. THOMPSON. I have just one more comment. I am disturbed by the terrific emphasis on mathematics and science and to the exclusion of the humanities. Don't you think that your scholarship program should be broadened to include outstanding students with aptitudes in any field of learning?

Secretary FOLSOM. Of course we, as you know, don't have any restrictions at all as to course of study for the person who receives a scholarship, but we say they should have good preparation in math and science.

Mr. THOMPSON. However, you certainly do say:

> In making awards, preference will be given to students with good high school preparation in, or aptitude for, science and mathematics.

Secretary FOLSOM. Either preparation or aptitude. We say other things being equal he would get a preference. We are doing that because we feel that nowadays the man who is going to be a leader, and these youngsters, we hope, are going to be the leaders years from now, these able youngsters, and that they ought to have good preparation in math and science in high school. We don't say they ought to be experts at all. We say they ought to take courses in it.

Many, many of the good high schools nowadays require that and many of the colleges require it, but we want to be sure that these youngsters get such preparation. We would like to have them get this preparation, and also it would help strengthen, we think, the teaching of math and science and it will attract more youngsters into these fields. We say this is going to be a factor in considering this.

Mr. THOMPSON. I couldn't agree with you any more that we need more help in science and mathematics, but this program is the spawn, to some extent, of the sputniks. Suppose that had been an advance in biology. Would you have a program to educate 40,000 biologists?

Secretary FOLSOM. This was under consideration quite a little while before sputnik appeared, as I indicated. The trouble also is that certain imbalance developed in recent pears. We are not giving proportionately as much math and science in schools that we used to give and we are trying to restore some of that, mainly because of the shortage of teachers in math and science, so what we are really trying to do here is restore the balance that we formerly had, and we don't in any way want to detract from the other basic courses in humanity, which we think are just as important as science and math.

Mr. THOMPSON. Mr. Secretary, you have a limited number of scholarships and with the preference for math and science, obviously there is going to be an imbalance.

Secretary FOLSOM. For instance, the people who turned out to be selected might want to go into English or history, but they ought to have had good preparation in science and math. We don't say they ought to be scientists, and mathematicians, and all. We simply say they ought to have preparation or aptitude for it.

Mr. THOMPSON. Thank you. I think your statement is fine and that your bill is excellent as far as it goes. I would like to see it expanded.

Mr. ELLIOTT. I recognize the gentleman from North Carolina, the chairman of the full committee, Mr. Barden.

Mr. BARDEN. Mr. Folsom, I am getting just a little mixed up on our program. I would like to call to your attention a statement made by the President, and I quote:

> The wealth of the world is created by the work of skilled hands on raw materials. Our magnificent system of vocational education is constantly developing increased understanding of raw materials and is helping to develop the skilled hands and the clear minds essential to turning those raw materials into useful weapons.

I understand there is agreat need in the Defense Department, for instance, for those who have finished these vocational schools to handle these technical and scientific devices. Is that the information you have?

Secretary FOLSOM. Yes; I think there is a need for technicians.

Mr. BARDEN. I believe, Mr. Folsom, you were a member of the Joint Federal-State Action Committee that filed its report in 1957.

Secretary FOLSOM. Yes, sir.

Mr. BARDEN. I wonder if you concurred with that committee in the discontinuance of the vocational training program.

Secretary FOLSOM. That committee in their recommendation considered that these programs have now been in effect for, say, 40 years, and at the time they started the plan the purpose of the Federal Government was to stimulate the introduction of these vocational education courses in the high schools throughout the country. The Federal Government participation is now a pretty small part of the total amount being spent.

This Commission did not say that these programs should be discontinued, but that they thought it was one responsibility which should be taken over completely by the States and local governments without Federal participation. At the same time the Federal Government agreed that they would turn back to the States a certain part of the telephone tax which could be used to finance the additional expenditures made necessary by transfers of these programs to the States. That was a program agreed upon by the nine governors and

the representatives of the Federal Government participating in this conference.

You will find very clearly in there that we don't say anywhere that these programs should be discontinued at all. We thought they performed a useful purpose.

Mr. BARDEN. However, this change, which is a discontinuance of the vocational training program as we now know it is supposed to take place with the vocational training in 1960.

Secretary FOLSOM. 1960. It is not in effect this next year.

Mr. BARDEN. I don't know how much study you have given to the effect of your change. We will take, for instance, the so-called tax benefit that you are going to relinquish to the States. We will take Alabama; we will get $668,634 less. The State of California will get $12 million more. I will take the State of Connecticut; Connecticut will get $1,222,000 more. The State of Delaware will get $135,000 less. The State of Illinois will get $1,020,000 more. The State of Indiana will get $1,493,000 more. The State of Iowa will get $16,000 less. The State of Kansas will get $400,000 more. The State of Kentucky will get $2,498,000 less.

If you will match those figures with the States where the need exists, you will find that to those who have the most you have been giving more and you take from those who have the least. When you have a program, Mr. Folsom, that permits and receives the type praise the President gives this and makes the record that it is making and provides the almost indispensable man that the Defense Department now says they must have, it seems to me it is a bad time to trade horses in the middle of the stream. How can we reconcile that now, Mr. Folsom, with the proposal that you now come in with for a new program to provide in part exactly what vocational training is doing on about $30 million?

We are going to substitute a billion-dollar program. How can we justify that?

Secretary FOLSOM. Of course the program we are talking about here is quite different. We are using the same approach as we did in vocational education, but it covers a much different field than the vocational-education program did. It covers a much wider field.

Mr. BARDEN. At the moment, Mr. Folsom, are we not spending upward of a billion dollars in Defense Department in furnishing the highest priced and most modern vocational-training equipment the industry will provide in giving vocational training?

Secretary FOLSOM. I don't know what the figure is. This program that you are mentioning here is one that we have discussed with the governors. The purpose of this conference with the governors when the committee was set up was to see if there were any programs that the Federal Government had in effect for a long time could be turned back to the States and at the same time that taxes could be turned back.

This is one program that the governors and representatives of the Federal Government agree on, and it has been approved by just those nine governors. It has not been approved yet by all the governors and it is still not in final form.

Mr. BARDEN. It has been approved in the budget message. It doesn't make any difference what the governors say when it reaches that point; does it?

Secretary FOLSOM. That depends on legislation, of course. You have to have legislation to have it effective.

Mr. BARDEN. I, of course, as you know, have been tremendously interested in vocational training because I have always felt and still do, that a man is not educated until he is able to earn a living. He just doesn't have much education in my thinking, and it disturbs me greatly to see that we are swinging off from something that has been tremendously successful at a bargain, $30 million is all the Federal Government is putting in that.

Now we will spend I don't know how much in the other end.

Mr. Secretary, have you conferred with the Defense Department on this?

Secretary FOLSOM. Yes; we have discussed this program with them.

Mr. BARDEN. Are they going to cooperate with you in handling of these students, or are they going to reach in and take them as they have been doing in the past?

Secretary FOLSOM. Do you mean on the selective service?

Mr. BARDEN. Yes; I am talking about that.

Secretary FOLSOM. That is a matter which we haven't gone into very thoroughly with them, but we intend to do so. Of course these able students are already deferred from the selective service.

Mr. BARDEN. Yes, but, Mr. Secretary, we must look at things with some degree of practical reasoning. The pressure is put on these high-school kids. They virtually tell them they are slackers if they don't go and discharge their obligations, and millions of dollars are spent in appropriations for the Defense Department, advertising some 200 courses by the Defense Department, trying to make them think how much more valuable it is, how much quicker they can get the education, and it won't cost them anything, either.

That is the kind of competition that I don't think is good for America and I don't think it is good for our educational system.

Secretary FOLSOM. As I told you the other day when we were talking about this, we intend to take this up with the Defense Department and discuss the matter some and see if we can come to some sort of understanding.

Mr. BARDEN. We are dealing, according to what you say, with a very sick patient. I am afraid we might delay the treatment a little.

Secretary FOLSOM. These able youngsters that we are talking about under the President's plan will go right on through college, all right.

Mr. BARDEN. Back in 1955, Mr. Secretary, and at other times I fought as hard as I knew how to get an amendment in that would permit those kids to go to camp for 3 months in the summer, back to college, 3 months next summer, back to college, 3 months the next, and back to college. I thought then it was practical. I thought it was needed. I think it more so, but the administration fought it. The Defense Department fought it. And it was a pretty lively scrap, but I got licked. I am going to read just what was said then.

We can stand here and let out these blood-curdling yells about the scientific men Russia is turning out—

this was in 1955—

about those planes that go 850 miles an hour, about those terrible death-dealing scientific machines they have. We can hear all of that, if we please. How did they get them? It was not the soldier who could just do squads right or squads left. It was the scientific men, the chemists, the physicists, the electronic men, the

well-trained men, those who could think, invent, and understand those gadgets, and develop them. Now what have we accomplished which is more valuable to America in the time of war or peace, an educated boy or an uneducated boy?

Which is more valuable to America, certainly in war, in a threat of war, a boy who is freshly trained every year for 4 years or draft him, put him in for 2 years, then let him forget all in 12 months?

There is another statement over here. All of this has been going on all these years, Mr. Folsom. It didn't just happen in the last 6 months since the sputnik circled around over Washington. They are writing all these stories about the sputnik is going to change the climate and going to shift the gulf stream and going to do I don't know what.

I have read so many stories until sometimes I think it has me a little cracked, but I have this abiding faith. Almighty God hasn't abandoned his throne. He hasn't turned over the operation of this world to the inventor of sputnik, to the Republican Party, the Democratic Party, or any President or presidential candidate. He hasn't abandoned it and I believe just the plain kind of good commonsense that this country has used to get where it is will get it further.

I want to read just this, and I quote from a speech made that night on the floor:

But I do want to emphasize that I have been on the floor on this subject many times and, regardless of how long I stay here, every time I have an opportunity I shall attempt to emphasize the absolute necessity of education in our defense setup as well as in our Government and otherwise. We cannot be strong militarily unless we are strong mentally.

I think that is fundamental. We must have more scientifically trained men, more men who understand the speed of this age, because we cannot put out as many foot soldiers and depend on mass warfare any longer. You must be able to compete in speed, in science, and anybody who is thinking knows that the next war we have—God forbid we ever have one, but if such should happen you know it will not be fought and won with brawn alone. It will be a brain contest of science, of electronics, atomic and kindred weapons. It will be a question of getting the high-speed jet bomber before it delivers its lethal cargo. If we cannot do that, then the number of men will amount to little.

In my opinion our survival could very easily depend, as it has at times in the past, upon trained, skilled, and scientific minds.

Secretary FOLSOM. That is a very good statement. It is a good endorsement I think of our own program.

Mr. BARDEN. I will have to disagree with you to this extent: I say to you that this need and this thinking did not just generate in the last few weeks. What we have done though is that we have permitted things to go on that certainly in my opinion haven't been to our best interest.

Mr. Folsom, we in Washington have about reached the point that we sometimes seem to think that nobody in America is doing like Washington thinks they ought to do, and you know when I go home I find out that sometimes we are not doing what they want us to do, so that there ought to be a getting together.

As I understand it, your proposal now is to make the scholarship a gift. Do you know that the principal fight and the principal thing that defeated my amendment on the floor of the House was they contended that it was class legislation, that the high-brow boy would get a chance to go to college, but the fellow that didn't go to college wouldn't get any consideration?

That was the fight and the speeches are here and I am going to preserve them, because a lot of folks are going to be interested in them.

Do you anticipate that kind of attack on this?

Secretary FOLSOM. I don't think so, because I think we can show that, as far as the Federal Government is concerned, our chief interest is to develop these boys. We are particularly concerned, to put it another way, with the boys from families that might not have thought of sending the youngsters to college, because it hasn't been in their background at all. Yet there might be many able youngsters, particularly scientists, leaders in many, many fields, who haven't thought about going on to college and yet who might have just as much capacity for it as many of those who know that they are going to prepare for college.

The main purpose of this early identification is to find those youngsters when they get into high school, to see if they have this potential ability, and to be sure that they get them interested and get the family interested so that they will keep them in school so that they will go on and develop to the greatest capacity that they have within them.

That is the main purpose of our program.

Mr. BARDEN. How would you interest the mother and father?

Secretary FOLSOM. We would simply have the teacher or the counsellor in the local school go to them and say "You have a youngster here and from what all our tests indicate he has lots of native ability. We would like to have that boy go just as far in his education as he possibly can. We think he ought to be prepared to go beyond high school, so he ought to take a course that will prepare him for college."

At the end of the time if he gets through high school and he convinces them that he ought to go on to college and shows a possibility of making a good student there, then he might get one of these scholarships.

Mr. BARDEN. Don't you think fathers and mothers have been doing this since this country started?

Secretary FOLSOM. We find in the GI bill, for instance, that many boys went to college who would not ordinarily have gone and they turned out some awfully good students in that group.

Mr. BARDEN. That is always true.

Mr. JOHN A. PERKINS. If I may add, Mr. Barden, to what the Secretary said, I think the point you make about the tendency of a certain level income family to send their youngsters on to college is evident in all the analyses that have been made of who goes to college and who doesn't go and the point you made in your remarks was very well taken.

This scholarship and counseling guidance and testing program is very largely oriented to try to overcome this past circumstance. There are lots of awfully bright kids today who are born and brought up in families where it was never in their family tradition or expectancy to send those youngsters on to college. By an early identification of talent it is to be hoped that the school authorities will become more cognizant themselves of the need to harvest this fine crop of youngsters that was born in the late depression years, for they are the ones on whom we are going to depend in the years to come.

The school authorities will work with the youngsters and they will also go out to the family, perhaps a foreign family, which hasn't yet gotten so completely into our way of doing things in this country that they anticipate this youngster going on to college. They will work with that family and say "Young Jim here is a mighty good

boy. He has lots of capacity and for his own good and the family's good and, what is more, for the country's good, he needs to have a scholarship and go on to college.

"Indeed, because of his ability, with this scholarship he would no doubt be deferred until his training was completed."

It seems to me that what you have been saying and pointing out over the year does, as the Secretary suggests, fit in very closely with the thinking that underlies this bill.

Mr. BARDEN. Let me state to the gentleman I admire greatly your ideals. I question seriously the practical side of your idea. I am not so sure but what we have more responsibility for the trend right now that seems to exist in the school because in this country for the last several years it has been preached millions and millions of times to let the Government take the responsibility of your child and educate him.

Now we are fixing to build up the atmosphere with the mother and father that here is the Great White Father, going to give him a scholarship. When you add up your scholarships you won't have many scholarships out of a billion dollars for 4 years. You will have a sprinkling. You will not be able to change the philosophy and thinking and the attitude and the trend of the American people in a very few years.

That requires time and time only will bring that about. What worries me about this program is the fact that we overlook that thing that in my opinion is absolutely indispensable to the boy in getting an education. He must have the desire and, if he does not have that desire, then you can waste a million dollars on him and he will be just out of it.

I don't see anything here where we treat the first things first. I think the success of the vocational training program was what equipment they could get their hands on and, understand, the Federal Government didn't give a dime for equipment. The figures that you have read here concerning the number of kids in high schools that have available a chemistry laboratory I do not think are correct or even close to being correct, because I have been in too many high schools recently and there isn't 10 cents worth of chemistry laboratory equipment. They wouldn't even know what a piece of electronics equipment would look like. There isn't any physics equipment there. In my opinion, instead of reaching into that high school and getting the bright mind as you would determine it, instead of giving a thousand or two thousand dollars to that boy you had better put $1,000 or $2,000 worth of laboratory equipment in that school and kindle in him the spark and the desire to go on. You can't teach chemistry in a textbook in the high school.

Secretary FOLSOM. Mr. Chairman, as I pointed out, a good part of our program, a good part of the $145 million would go to the teaching of science and math in the schools. They could use it for either laboratory equipment or for getting more teachers or for paying higher salaries to the present teachers. A good part would go to equipment.

Mr. BARDEN. I am afraid that is the way it is going to be used.

Secretary FOLSOM. A good part of it would go for equipment.

Mr. BARDEN. I would not like to have the job of building a rowboat without the proper tools with which to work and I say to you that

you have thousands of high schools in this country that do not have one penny's worth of laboratory equipment and in those that do have equipment it is antiquated.

That is right; isn't it?

Mr. JOHN A. PERKINS. Yes.

Secretary FOLSOM. The big bulk of our money is going just for that purpose. We are leaving it to the States on a matching basis. If a local school wants to put all or part of it in equipment, they can do it.

Mr. BARDEN. Mr. Folsom, let me tell you this: We can't yet have everything we want and I want to say that this matching isn't a magic formula at all. The Federal income tax now reaches up to 92 percent. The Federal Government goes into a State and gets its money. I just left a conference in North Carolina where they were working and trying to set up an arrangement for one of the finest pieces of equipment I have ever heard of in my life and that is these films of Encyclopedia Britannica. They are trying to raise money to set that up in the schools. One of those series of films in one course costs $16,000 in color and they are perfectly marvelous.

Have you not overlooked the building of that desire in the kid first?

You take chemistry. You put your laboratory equipment in there for chemistry, put equipment in there for electronics, put it in there for physics. What do you do? You make it a very interesting subject to that kid. He begins to see things that spark his curiosity. He becomes interested. My boy happens to be a doctor. The only piece of chemistry laboratory equipment he ever saw in his life until he went to college was a chemistry set that I bought for him in his senior year and without any instructions he burned up my wife's best card table and darned near blew the house up.

It just doesn't make sense for us to overlook all these kids getting their hands blown off with baby sputniks around here and so forth. That is no compliment to the school system.

Mr. JOHN A. PERKINS. I agree with everything the chairman has said, Mr. Secretary, almost 100 percent.

Mr. BARDEN. Let's make it a little better and agree to 100 percent.

Mr. JOHN A. PERKINS. I think we could. As a matter of fact, in this first year with $7.5 million for scholarships, as against that, as the Secretary said, there is $110 million to stimulate science and math teaching, which money can be used for three purposes, and one of the foremost is the purpose which you suggest is so important—equipment.

Mr. BARDEN. Let me say this: The budget report has already put the kibosh on the program of stimulating vocational training. Let's go on from here. I said that the matching formula wasn't anything magic. I want to tell you right now that with this thing of the Federal Government sitting up here and saying "All right; you haven't got anything to do but put up half of the money," we had better begin to think where they are going to get that half because we are not leaving it there for them.

As I said, the tax now is up to 92 percent. If we put another million dollars on, can the State say to the Federal Government, "Lower your income tax rate and leave us a little margin"? No.

The Federal Government can move it to 94 if it wants to or move it to 99 and constantly the Federal Government is taking and taking and taking, and the States will have less and less and less to run its traditional, necessary, and proper functions, so when we say to the State, "You put up half the money," the State will look back at you and say, "Well, where are we going to get it? You taxed everything in the world down here except the air we breathe," and they have to get it out of what you have left them. That is a very, very serious thing. I think we need the scientists. I fought that when you folks were not paying any attention to it whatever, not a bit. I was some kind of an egg-head or something up here that just wasn't thinking right.

If it is a national emergency I doubt, I doubt seriously if it is quite as much emergency as it has been built up to be, because we are in business and the colleges have fine chemistry departments and so forth.

I do think it is a serious need and it could get to the point of an emergency.

If that is true and if the Federal Government recognizes that and it is something in the interest of defense, then let's trim our amount a little bit and let the Federal Government pass the money down there and let them do the job.

This thing of laboratory equipment, Mr. Secretary, I can't put in the second class. With me it is first.

Secretary FOLSOM. We put it first, too.

Mr. BARDEN. Have you made any study to learn what an approved, modern-equipped high-school laboratory to teach high-school chemistry would cost?

Secretary FOLSOM. Yes. We have quite a lot of information on that. Dr. Derthick can explain it or one of his men can give you the figures that we have developed on that. In this connection I might also add that part of this program which I haven't touched upon at all has to do with what the National Science Foundation is doing. They plan to greatly expand their program to try to interest these able youngsters in going into science and they have developed with some of the institutions, like MIT, special films for aid in teaching science, so that is all part of our program to expand all of this.

Mr. BARDEN. This worries me because we talk about some of these things we have given some thought to. I think this is important enough and serious enough that we should have the pattern laid out.

Secretary FOLSOM. We have it laid out. Mr. Derthick can explain in more detail this afternoon exactly what we intend to do in each one of these fields.

Mr. BARDEN. Personally, the school I went to wasn't anything akin to a first-class high school, but when I left there I had finished solid geometry. Now they won't know what you are talking about in the average high school if you said solid geometry, and I had read Latin right on through Virgil, Cicero, Caesar, and all the rest of them. Now they don't take that. They learn how to serve a meal or properly hold their shoulders when they are dancing, and so forth.

However, if you were to start with those high schools next year, and you found 5 high schools with no laboratory equipment whatever, but you had some bright boys there, and you then had 5 high

schools that had absolutely modern, good laboratory equipment and they had shown wonderful minds in science, in math, in chemistry, and physics, what would you do? Would you take them all from the school that had the laboratory, or would you take those that are 4 years behind those that had the laboratory?

Secretary FOLSOM. We say either preparation in or aptitude for. If this fellow you are talking about hadn't had any chance his aptitude test would show he has the ability in this field.

Mr. BARDEN. Yes; but you need scientists and you need these youngsters further along and here 1 is 4 years ahead of the 1 that didn't have the laboratory.

Secretary FOLSOM. That is exactly why we want to stress this aid right now for math and science, so these schools you are talking about will do a better job starting right now. We don't want them to wait.

Mr. BARDEN. Mr. Secretary, don't you honestly believe if we would put in an absolutely modern laboratory in these schools you would inspire enough kids to go into the sciences, men and women, that your colleges would be flooded with them instead of having to send them on scholarships?

Mr. JOHN A. PERKINS. There are really two things that would greatly help. You have to have good equipment, but more important even than good equipment is good teachers. Inspiring teachers will do more to motivate youngsters perhaps than any other one thing and, as the Secretary said in his statement, we have been at a disadvantage in recruiting high-school science and mathematics teachers in recent years because the going rate for people with those trainings is so much greater in industry, and indeed even in Government, than it is in teaching that they just have passed by teaching.

Mr. BARDEN. I go along with you on some help for the teachers. I happen to know that in one State that I know of that has some wonderful science schools, and so forth, there was but one physicist that went into teaching. I go along with that.

Mr. JOHN A. PERKINS. The big money in this legislation is really to do these two things that you are mentioning, getting us better teaching and better equipment in the science and mathematics areas in our high schools.

Mr. BARDEN. If we will put first things first we may get our sputnik off the ground, but up until now you are stuck. When it comes to your loan feature, any boy or girl that doesn't want an education bad enough to borrow money doesn't want an education and doesn't have the desire that will really back up the sacrifice he must be called upon to make.

I am sincere in that, because I know a lot of them now, and thousands of them were in college when I was in college that didn't have a nickel's worth of help from anybody except what little they borrowed from the loan fund in the college, and the loan fund at the University of North Carolina right now isn't being used, and this is a well-known fact. Don't you think we must give some consideration to the desire?

Mr. JOHN A. PERKINS. Absolutely.

In talking about counseling a few minutes ago, I mentioned the effect that counseling people in the schools, in your hometown schools and my hometown schools, would have on the parents. At the same time the biggest part of their work would be to influence these youngsters to become the kind of kids that you are talking about, and I agree with you entirely about building up this incentive in the kid.

That is what we have to do and to a certain extent we may have let that run downhill. I don't know. It is hard for us to say. The older we become, the more we think that each generation may not have the same get-up-and-go that we had, but I do think that we have to, in the counseling process and through getting inspiring teachers in the schools, encourage these kids to make the most of themselves, which ultimately I would hope would have so much meaning to most of them that they would borrow money from the freshman year on if they had to get an education.

Mr. BARDEN. You are talking about two things there, and if you have one you certainly don't need the other. If you have the right kind of teacher you can keep the counsel out.

Mr. JOHN A. PERKINS. Of course the teacher and a counselor are virtually the same thing. If a teacher isn't counseling I feel he is not a good teacher.

Mr. BARDEN. However, you pass this law and you will have more folks running around knowing everything as a counselor, telling everybody how to live and what to do. I have had some experience with them. I don't mean they are bad folks. They are not. They are well intentioned and fine folks, but they haven't bumped against the practical side of the thing like the teacher that really has her heart or his heart in teaching.

If you have the right kind of teacher you can cut out that paragraph about the counseling and save some money.

My teacher had more influence on me than anybody else when I was in school, even the commencement speaker.

Secretary FOLSOM. Dr. Derthick, I think, could help on this particular point.

Dr. DERTHICK. The pointed thing about your discussion is that you are talking about fundamentals I think that are dear to the hearts of all of us, and I agree with you that the teacher is the key factor in this matter of counseling, and actually the counselors will be teachers, too. They will come from the best teachers we have; they will be able to take the specialized training and to develop a specialized know-how; they will have the time to help the teacher bridge the gap between what he has to do all day long in conducting his classes, seeing the children in the nooks and corners of the day, and calling on the parents and so forth. They will be a team, and we won't have many counselors, actually.

Mr. BARDEN. That is a little encouraging, but you put the right kind of teacher there and I am for it. That teacher knows that kid better than the counselor will know him.

Dr. DERTHICK. The counselor will know a lot about occupational guidance and vocational opportunities, will know a lot about financial aid and loan funds, and will know a lot about test interpretation that you couldn't expect the classroom teacher to carry in her mind.

Mr. BARDEN. If I would have had to have gone through all that I would have never finished high school.

Dr. DERTHICK. Of course when you were in high school, Mr. Barden, there weren't nearly as many children for the teachers to take care of.

Mr. BARDEN. There was a darn sight higher percentage of education, though, because we finished solid geometry and we finished our Latin, and that was required.

Dr. DERTHICK. You and I wouldn't have any conflict about the importance of hard and thorough courses in school. I am old fashioned myself and that is the kind of school I try to teach.

Mr. BARDEN. We are scattering our shots in this field of education.

Mr. SECRETARY. I wouldn't even embarrass you and ask you to tell me all of the different funds that you handle and pass out in the field of education. We are into everything now.

Secretary FOLSOM. We have very limited funds, as a matter of fact.

Mr. BARDEN. You fellows get accustomed to saying fairly limited until you pass the billion mark.

Secretary FOLSOM. In the Office of Education, for instance, in the first place, our own budget is quite limited and the funds we pass out for vocational education and impacted areas are about the only funds that we have.

Mr. BARDEN. There are these funds that you grant to colleges, and medical schools, and so forth. I don't recall what they are. We just pass the law and you fellows name it.

Secretary FOLSOM. That is the Public Health Service. The National Institutes of Health have funds to go into medical schools, but I am talking about Federal programs for education.

Mr. BARDEN. Doesn't the Defense Department now send fellows to schools and colleges? This committee has a terrific responsibility here, Mr. Secretary, and the first thing we know we are going to have a crazy quilt and we won't know what we are doing. The Defense Department ought to come in here and lay on the table what they are doing. They are spending millions of dollars in this thing of scholarships. They send men to the various institutions. They used to send lawyers to Harvard.

Really this committee and the chairman of this subcommittee have all these questions to answer and the Defense Department ought to lay it down. We started one time to try to find out what they were doing in the field of education and we found the Federal Government was spending more money than it took to run the entire public school system of America.

That isn't to be looked at lightly, and I am very serious when I say this committee should have the information.

Secretary FOLSOM. We thought that. It has been brought to our attention many times. There is a provision in our bill here that provides that:

> The Secretary of Health, Education, and Welfare shall consult and cooperate with the heads of other Federal Departments and agencies which administer the program of student aid or of assistance to or utilization of institutions of higher education for training other educational purposes, with a view to the better exchange between such agencies of information concerning their respective program and the development of policies and procedures——

Mr. BARDEN. Isn't that being done?

Secretary FOLSOM. Not very good.

> we will strengthen the educational programs and objectives of such institutions.

It hasn't been done.

Mr. BARDEN. Uncle Sam is just getting too many hands and one hand does not know what the other is doing.

Secretary FOLSOM. We want to do something about it.

Mr. JOHN A. PERKINS. The Office of Education is a very small hand in the educational system of the country at large.

Mr. BARDEN. I am in favor of keeping his hands that way.

Mr. JOHN A. PERKINS. Or the educational programs of the Federal Government. Many of the things which seem to concern you as you have made your remarks have been exactly the concerns that we have had that have motivated this legislation, one of them being this last thing that you just mentioned, the coordination of educational programs throughout the Federal Government, giving the Office of Education some authority thereby to do something about this.

Mr. BARDEN. I know the law that created the Office of Education and why it was created and I think it was very laudable, and a program worthy of implementing and carrying it on.

On the 12th of this month the chairman here has made arrangements for one concern to come in here with laboratory equipment and electronics. I am about to get hipped on that and when I read about the Department advocating the discontinuance of the vocational training setup, that just kind of set me off. I think instead of doing away with that program, and that is what this move is designed to do as far as that is concerned, we better have 1 that is as good to take its place and I am definitely of the mind that your laboratory equipment is your No. 1 must. You are not going to, in my opinion, inspire these high school boys to study chemistry, electronics, and physics, and so forth by some teacher trying to read it to them out of a book. Chemistry is simply a horrible subject just to read the text.

Secretary FOLSOM. We agree with you absolutely on that and that is why we made some provisions for it here.

Mr. BARDEN. Some provisions?

Secretary FOLSOM. That is the big part of our program.

Mr. BARDEN. I think about the first thing they do in the construction of a battleship is lay the keel and then they come along with the superstructure. I would like to see this program. I would like to go along with a good program in that direction, but I do not want to go ahead here and give that a second-rate place and then find myself going into all this business you are talking about, advising them, and counseling them, and so forth. If we put the right kind of teachers in there and put the right kind of equipment in there, don't worry; American kids are just as solid as they have always been. The only thing is their mom and pop have been a little bit slow to put them out the door in the morning and they expect them to come back in the evening and they don't know exactly what has happened but they have been to school.

If they keep building up that trend in this country, we haven't seen any trouble yet, but we are going to be in it.

This thing of leading everybody to believe the Great White Father is going to educate them is just against our best interests, because you know you are not going to do it. You know you are not going to send but maybe a couple of hundred from a State. There are that many counties in most States.

Secretary FOLSOM. The bill actually reads:

Provision of laboratory and related special equipment necessary for teaching science or mathematics, and minor remodeling of laboratory and other space used for such equipment.

That $110 million is for that along with the teaching—$110 million for the three purposes of employment of additional teachers in science and math, or for an increase in the rate of compensation for the present teachers, and for equipment. We are leaving it up to the States and local school districts as to how they are going to divide that money up. If they want to put it all in equipment they can put it in equipment.

Mr. BARDEN. Mr. Secretary, I think your bill is going to have to be refined a little bit. I don't believe we are going to be able to do all that is in this bill at one time. I think we had better lay the keel and put the emphasis where I think it will pay the best dividends and do the best job.

Secretary FOLSOM. Of course, we think all three of these are very important. One point is getting better teachers. In order to get better teachers you have to pay them properly. As for more teachers, we don't have enough teachers in this field. We need equipment, too. All three are important.

Mr. BARDEN. Money won't do everything. There is some desire and interest and so forth to go along with it.

Secretary FOLSOM. You have to have the money to get the equipment, though.

Mr. BARDEN. I believe I told you the other day that I don't agree with a lot of these people who think that they can drop $100 million in some kind of a slot machine and run around and catch the scientists when they come out. It is not going to be that simple. You are not going to get your teachers that way.

Secretary FOLSOM. We certainly know that.

Mr. BARDEN. You are in a competitive field. You know it. We may have more teachers on our hands if the upturn does not come pretty soon. We may solve that in an expensive way.

Mr. PERKINS. Would the chairman yield to me?

Mr. BARDEN. Yes.

Mr. PERKINS. Mr. Secretary, pursuing the subject that the chairman of the committee here has discussed with you, vocational education, I too was concerned when the President in his budget message this year recommended the elimination of vocational education funds commencing in 1960. I have just one other question after I finish this one.

Did you take part and approve of that recommendation or not?

Secretary FOLSOM. It was approved by a joint committee of the 9 governors, and I think there were 7 representatives of the Federal Government participating in those conferences. It was not intended by any of us that that would result in discontinuing of the vocational educational program.

Mr. PERKINS. How many men were there? Was the full Commission, the Joint Commission, there? I mean, what was the representation between the States and the Federal Government?

Were there just a few members there?

Secretary FOLSOM. Of course, this is the result of several different meetings of the joint committee.

Mr. PERKINS. At the time the final recommendation was made how many members of that Commission were present?

Secretary FOLSOM. I think probably they all approved of the final recommendation.

Mr. PERKINS. You did approve of it there?

Secretary FOLSOM. Yes, sir.

Mr. PERKINS. I am wondering what happened to the school construction recommendation that your Department was for last year. Considering the educational crisis that exists in the country today do you still feel that school construction assistance on the part of the Federal Government is needed?

Secretary FOLSOM. There is still a great need for school construction, there is no question about that. We made some headway last year in cutting down on the backlog.

Mr. PERKINS. About 65,000 classrooms.

Secretary FOLSOM. Last year we figured 159,000. This year there is a shortage of 140,000, so that there is still a need, and we don't question the need for it at all. It is a question, though, of priorities. We think the proposal we make here has a higher priority than the school construction. We know there is a difference of opinion on that. That had to be taken into account and of course in the budget message simply said, as was pointed out, that we thought this had a higher priority than the school construction.

Mr. PERKINS. I take it, then, that the administration has abandoned their school construction program that you advocated a year ago. Am I correct in that assumption?

Secretary FOLSOM. The budget message didn't say that. It said that the item could be deferred in view of the overall budget considerations of the greatly expanded defense program and that this was more important and had a higher priority in the sense of national security than the other program.

Mr. PERKINS. Therefore, now you come before the committee, satisfied about abandoning completely the school construction program if the Congress will go along, and enact your scholarship program and give some assistance for the purchase of laboratory equipment to the States and perhaps to science and mathematics teachers; is that correct?

Secretary FOLSOM. Yes. We advocate this program now and we recommend deferring action on the other.

Mr. PERKINS. You don't care to make any recommendation at all to the committee now as far as school construction is concerned?

Secretary FOLSOM. No. In line with the President's budget message, of course, I go along with deferring action on that recommendation. Of course, I might say this——

Mr. PERKINS. Don't you think that we are getting a lot of inconsistencies in the whole field of education in the way that we have advocated one program and another program and then one next year, abandoning that program and coming up with another program? Do you agree with that statement?

Secretary FOLSOM. The administration recommended that program for 3 years and no action was taken by the Congress.

Mr. FRELINGHUYSEN. Will the gentleman yield?

Mr. PERKINS. Yes.

Mr. FRELINGHUYSEN. I think that perhaps this construction problem is one that lies largely with the legislative branch, not the executive branch. As the Secretary has pointed out, the administration has recommended assistance. This committee twice tried to get a bill through the House and it was defeated on both occasions, so

that, from a practical point of view, it looks unlikely that we could do anything even though we recognize that there is still a need for some kind of assistance, and there certainly is not inconsistency upon the part of the administration proposing other matters which need attention.

Mr. PERKINS. I want to thank the gentleman from New Jersey for his comment at this time, but I am trying to find the answer. We tried to enact some general Federal aid legislation here in the first two terms that I was in the Congress. They commenced, for instance, to give some better pay to science teachers and mathematics teachers. For a period of time thereafter everybody looked upon that as socialism or something. Then we got turned to school construction and the gentleman from New Jersey well knows that this Congress cannot enact any legislation without the active support of the administration.

Whether we had the active support of the administration last year I just don't know, but somehow I have a feeling it wasn't very active.

Mr. FRELINGHUYSEN. Very substantial support was lacking in Congress, I might point out.

Mr. PERKINS. No doubt that has led to the abandonment of the proposal altogether and here we come along with a proposal. I must say frankly that I agree with the chairman, though, that we have to provide some of the basis of this thing first. Then we revert back here to where we started 8 or 9 years ago before this committee—with proposals from the Department and at the same time recommending the discontinuance of a program that has produced more skilled workers, technicians, and efficient farmers, vital to our defense of this country, than any other program in existence so far as the schools are concerned—and that is vocational education.

I just can hardly visualize what is going on in the field of education when we put these things together piece by piece and begin to look at them, and it doesn't take a man with any intellect to analyze these things. Any individual with a fifth-grade eduaction will wonder about these inconsistencies and I just hope we can get started and, when we start on some program, not back up and run from it, but stay with it. That is my viewpoint.

Mr. FRELINGHUYSEN. I think we Members of Congress have a responsibility here, Mr. Chairman, but that doesn't make the problem any simpler.

Mr. PERKINS. We do, but we need the support of the administration in this thing. When we need the assistance we should get the assistance of the administration.

Mr. NICHOLSON. Will you yield?

Mr. PERKINS. Yes.

Mr. NICHOLSON. Have you any statistics on how much money is raised each year for scholarships from different sources?

Secretary FOLSOM. Dr. Derthick has that. He will bring it out in his testimony.

Mr. NICHOLSON. Is it increasing?

Secretary FOLSOM. We have the amount that is available from institutions. The figure here is from the report we got out in September. It shows there were 237,000 scholarships valued at $65.7 million in 1955 and 1956, compared with 124,000 scholarships worth $27

million in 1950 and 1951, the last survey which we made. Those are scholarships that are available through the institutions. We, of course, don't have the figures as to how many scholarships are made by individuals. We haven't a complete survey of scholarships granted by corporations. This represents a survey we made of 1,500 institutions enrolling about nine-tenths of the Nation's college and university students.

Mr. NICHOLSON. Is that foundations and big business? The smaller ones aren't taken into account, two or three hundred or five hundred?

Mr. JOHN A. PERKINS. This is all the scholarships that the universities and colleges have to give through their own deans and their own facilities. There are scholarships that are given sometimes by individuals. You might decide that you would like to help the boy next door. He is a good youngster and you would like to see him go to college. You might give him a sum of money which is in effect a scholarship. Those are given in many, many instances and there is no way of identifying and finding out about them.

Mr. NICHOLSON. This $65 million is just for colleges themselves who give scholarships to boys and girls?

Secretary FOLSOM. Scholarships administered through the colleges.

Mr. NICHOLSON. That doesn't include these big foundations?

Mr. JOHN A. PERKINS. Oh, yes. They will give the grants to the institutions for distribution through them. Most commonly that is the way they do it. The ones that would be hard to identify there might be occasional corporate scholarships which would not be identifiable within this amount of money, but for the most part that would not be the case.

Mr. NICHOLSON. Would most of these scholarships be available on borrowed money from the institution?

Secretary FOLSOM. Oh, no. These are not borrowed sums, they are outright grants. Universities out of their tuition or appropriations from their endowment income will identify certain sums for scholarships and they will give that to the able students.

Mr. NICHOLSON. Do you remember what some college president from the Middle West or Far West had loaned on these scholarships?

Mr. ELLIOTT. I think you refer to Mr. Risty from the University of Minnesota, who said that his loan fund ran about $300,000 a year.

Mr. NICHOLSON. Yes.

Mr. ELLIOTT. And he said that he could lend more money if he had it. I believe that was the substance of his testimony.

Mr. NICHOLSON. That is the only question I have.

Mr. ELLIOTT. The subcommittee will adjourn until 1:45, at which time we will resume, if that is agreeable with you, Mr. Folsom, and Mr. Derthick, Mr. Perkins, and Mr. Richardson.

(Whereupon, at 12:20 p. m. the committee was recessed, to reconvene at 1:45 p. m. the same day.)

AFTERNOON SESSION

The CHAIRMAN. The subcommittee will be in order.

The Subcommittee on Special Education and the Subcommittee on General Education meeting jointly in these hearings has the permission of the House of Representatives to meet this afternoon even though the House is still in session.

This subcommittee will not meet tomorrow so if it is impossible I hope that we might proceed in such a manner as to finish if possible with Secretary Folsom and Commissioner Derthick this afternoon.

I recognize the gentleman from New York, Mr. Gwinn.

Mr. GWINN. Mr. Folsom, I would like to ask you some specific questions for authority particularly, to support what you say.

You realize that in 17 pages of your testimony this morning, I think I am correct in saying that you did not cite a single authority outside of yours for any of the figures that you gave us. It was a general statement that we hear repeated over and over. We cannot go anyplace to check them on the basis of your presentation of these facts.

For instance, the chairman asked you how do you arrive at 10,000 scholarships. You just indicated that you talked it over and that is how you arrived at it, which left me to think that you just guessed at it.

What have you to tell us about where you get these figures?

Secretary FOLSOM. Mr. Gwinn, the first part of your question, as far as the factual statement to back up what we say here, I indicated in my opening remarks that I was going to give all of the basic considerations we had in mind, and Mr. Derthick was going to get into more specifics. He will present to you quite a few factual statements backing up our recommendations.

We have quite a lot of information available. Some of it we do not have available because the information cannot be obtained. He will give you specific facts.

As far as the scholarship program is concerned there are no specific facts available as to how many scholarships we need. It is just a subject which you cannot put your finger on exactly. I just said it was our best judgment of what would be required for what we had in mind for this particular program.

Mr. GWINN. Another thing, it seemed to me you left wide open, was the question of whether or not our school system is functioning to produce scholars to whom you can give scholarships, and to accomplish what you want to accomplish, namely, get more scientists and mathematicians.

Secretary FOLSOM. We think there is enough evidence available on that subject. We certainly ought to be able to turn out as many as 10,000 able persons, and many times that. I think the number and quality of the scientists we have turned out in recent years is a pretty good indication of what the school system has done.

We are not criticizing the whole school system here. We are simply pointing out certain deficiencies we think exist and which we think it is to the national interest to try to correct. I do not think the whole school system has gone to pot. I think it has accomplished a lot over many years.

Mr. GWINN. None of us would say that. But your testimony indicates that we are short or deficient.

Secretary FOLSOM. In certain areas.

Mr. GWINN. Why do we not correct those areas by talking and releasing information which would be helpful in building up weak places to do a better job?

Secretary FOLSOM. That is a part of our program, of course, but we do not think that just information alone will meet the situation in

time. If we had 10 or 15 years to do it in, it probably would meet it. We think the situation is urgent enough so that the Federal Government ought to step in these particular areas through the programs we have suggested, in matching grants, for instance, to stimulate the States and the local school people to do things quickly and promptly.

Mr. GWINN. You do not pretend in this program to set up any criteria of performance in these scholarships. This is not a national examination to get out the very best 10,000 we can for the Nation.

Secretary FOLSOM. Of course this scholarship part is a very small part of our program. We think each State has enough able youngsters who could qualify for this. We are not concerned about getting able people under this part of the program. We think that the States are in a better position to do the testing and selection. It is more in keeping with our system to have the States handle this rather than have a nationwide system.

Mr. GWINN. How do you determine how many scholarships to send to a given State?

Secretary FOLSOM. That is based upon the number of high-school graduates in that State. A State with 10 percent of the national total of high-school graduates would be allotted 10 percent of the funds. That is, graduates of high school.

Mr. GWINN. They give examinations in those States as they see fit, is that right?

Secretary FOLSOM. They submit a plan. It must be a reasonable plan. The Commissioner passes upon the plan on whether it is a reasonable plan for selecting the persons for the scholarships.

The selection must be based upon ability and need.

Mr. GWINN. There is quite a little control by the Commissioner?

Secretary FOLSOM. If they submit a plan to the Commissioner containing a reasonable method of selecting these scholarships, he must approve it.

Mr. GWINN. Here is a bright boy that applied to Yale for a scholarship, according to Mr. Griswold, president of Yale in the January 24 issue of U. S. News & World Report.

Mr. WAINWRIGHT. Is that not where most bright boys apply?

Mr. GWINN. This is just one example. This boy in his application showed in his junior year that he took English 3, American history, typing, speech, chorus, and physical education.

In his senior year in high school he took English 4, journalism, speech, personality problems, marriage and family, and chorus. He is a very bright boy. He might have gotten one of your scholarships.

Do you think that is going to help the program that you have in mind?

Secretary FOLSOM. I will read what the bill says as far as we are concerned on these scholarships:

> The State commission provides for the selection of individuals to receive scholarships from among eligible applicants therefore, the determination of the amount of such scholarships according to the standard procedures and criteria established by the Commissioner which the Commissioner finds provides reasonable assurance that the selection of individuals to receive the scholarships will be based upon ability to pursue successfully in an institution of higher education a course of study leading to a bachelor's degree determined after taking into account the results of tests and other evidences of ability collected pursuant to the State plan.

Then we go on to say that we will give preference to those who have good preparation or high aptitude in mathematics and science. All individuals who need financial assistance to continue their education in an institution of higher learning will be eligible to compete for scholarships.

That is the provision of the bill.

Mr. GWINN. They state where this boy in going to high school according to their plan it gives him a scholarship.

You would not be able to do so.

Secretary FOLSOM. If that boy meets these tests and shows he is one of the top boys in his State as far as ability is concerned and has an aptitude or good preparation in mathematics or science, he will be eligible. I do not see why he should not be eligible. Just because he took some of these other courses is no reason why he would not be a good man in college.

Mr. JOHN A. PERKINS. One of the things that we are seeking to do through this bill through the counseling, testing, and guidance is to identify no later than at the ninth grade level such able youngsters as the one in your example. Efforts would be made to counsel them away, in some instances, from courses that they might have a proclivity to take because they would be easy; but rather to direct him toward what we used to call the solid subjects that would prepare him well along the line of his ability for higher education.

I would hope that the total effect might be to lessen the number of youngsters who might pursue courses that are not so directly advantageous to their pursuing higher learning, and increase the number of youngsters taking courses which require them to work up to their ability.

Mr. GWINN. The only point of my questions of course, I hope is obvious enough. Are we not overlooking the real trouble here? It is not that these people need 10,000 scholarships. We need more scholars, do we not?

Is that not your real need?

Secretary FOLSOM. There is no question about that.

Mr. GWINN. Then why do you not help us to find out why it is we are not producing these scholars in sufficient number?

Secretary FOLSOM. We are producing many of them, probably not in sufficient number. I do not think there is any question but what in recent years we have not stressed the mathematics and science in high schools to the extent that we should have.

Mr. GWINN. Then it is not a lack of money, is it?

Secretary FOLSOM. Another thing you must take into account, when you compare percentages of children in mathematics and science courses, is that we have many more children in high school than we had before.

Mr. GWINN. All right. I know that.

Secretary FOLSOM. So the percentage might go down.

Mr. GWINN. If we have not done the job in some of the schools that we should, then it is not a lack of money, is it, that we face?

Secretary FOLSOM. No.

Mr. GWINN. It is a failure to teach the basic subject matter. Is that not so?

Secretary FOLSOM. I think in many cases that is true.

Mr. GWINN. If they did teach the basic subject matter and inspired the high school graduates in these subjects of science, mathematics, do you have any doubt in your mind that these boys would find the means to go to college?

Secretary FOLSOM. In order to do that we have to give them the right mathematics and science, and we will probably have to spend more money then we have been spending in order to get the right teachers in these subjects in order to give them the education they need.

Mr. GWINN. You have indicated a lack of teachers you need in these fields. What proof do we have?

Secretary FOLSOM. Mr. Derthick will give you that in his presentation.

Mr. GWINN. Why do you not give us that right now?

Mr. DERTHICK. We have evidence, Mr. Gwinn, that there is a general shortage of teachers, but the shortage is more severe in mathematics and science than in the other fields. Even a favored State as California, has a great proportion of the mathematics and science teachers who are not major students in those fields and who are therefore teaching outside of their fields of special preparation.

We have a good deal of information to prove those points that we are deficient in qualified teachers in mathematics and science.

Mr. GWINN. What is our information? We have got to have it.

Mr. DERTHICK. One study of mathematics in California schools, July 1956, indicated that nearly one-third of the mathematics teachers in high school departments did not have a college major or even a minor in mathematics.

Nearly 25 percent of the secondary school mathematics teachers in the District of Columbia are teaching without a major in the field.

In a recent report in the teaching of science in Illinois, there is cited a similar problem. The report further points out that the higher salaries offered to college graduates in science by Federal and State agencies and by industry are major factors in preventing the entrance of such trained personnel in the teaching profession.

If in these relatively favored school systems these problems exist, it is not hard to conclude that they exist in the less favored school systems.

Mr. GWINN. Who makes that statement?

Mr. DERTHICK. This report on teaching of science in Illinois?

Mr. GWINN. Who made that report?

Mr. DERTHICK. I can get that for you. It is by the State department of education, Illinois. We will have that in just a moment.

Meanwhile, I might call your attention, Mr. Gwinn, with reference to those 200,000 young people who never go on to college, we could draw from them a great many scholars that we need in college to major in mathematics and science.

I might tell you that the enrollments in mathematics and science in the last 29 years have increased very materially in this country actually.

For example, biology has jumped from a half-million in 1927 and 1928, 30 years ago, to 1,430,000 as of right now.

That is 1956–57, the last school year just closed.

I show similar increases in other fields of mathematics and science.

It is true that in such a subject as physics, while the enrollment has

increased in 30 years, the percentage has gone down. That is one of the things that concern us. We are looking for a number of potentially very able young people in physics. Though the enrollment has gone up, the percentage has gone down.

Mr. GWINN. That might be perfectly normal and perfectly right, might it not?

Mr. DERTHICK. You mean what?

Mr. GWINN. Percentagewise. It does not change anything. They might still be meeting the demand.

Mr. DERTHICK. Unquestionably. Maybe I can give you the authority for that report from Illinois. It was a report on the teaching of science in Illinois by the Southern Illinois University at Carbondale. The report is dated 1957.

Mr. GWINN. Read that last statement.

Mr. DERTHICK. The statement in this particular report cites a similar problem to that which I cited for California and for the District of Columbia, namely, that there is a severe shortage in mathematics and science teachers who are teaching in these subjects and those who are teaching these subjects are not adequately qualified, a great number of them, a great proportion of them are not.

This particular report points out that the higher salaries offered to college graduates in science by Federal and State agencies and by industry are a major factor in preventing the entrance of such trained personnel into the teaching profession.

Mr. GWINN. That has been stated over and over again, but the figures do not seem to justify it, because we have in the State of New York applicants for teachers' licenses, and 30 percent of the applicants come from industry.

Mr. JOHN A. PERKINS. But that does not say whether those people from industry are equipped to teach in mathematics. It may be a salesman who is turning to teaching, we will say, of the social studies.

Mr. GWINN. Let us assume that what you say is true. That our teachers are not qualified as much as the professional educator would like to see. Still we have not answered the question of how do you know we are short of engineers?

Mr. DERTHICK. First of all I gave you the experience of California, Illinois, and the District of Columbia.

Let me give you my experience as a local district school superintendent down in Chattanooga, Tenn. Repeatedly we would go for months and all through the school year and never be able to fill, with a fully qualified teacher, a position in mathematics and science where we had a vacancy.

Mr. GWINN. In teaching, you mean?

Mr. DERTHICK. Yes, in teaching. I think that school superintendents all over this country have that problem. We do not have to have studies to report it. We know it out of our experience, though there are studies.

We know that we have vacancies that we cannot fill where we use temporary people. We use substitutes. I have had the experience of having a turnover of 7 or 8 people in a single year trying to teach a ninth-grade algebra class, trying to keep that position staffed. That is repeated all over these United States. That is where the root of our problem is, one of them.

Mr. GWINN. I do not think you can make that deduction, Mr. Derthick. You may not be doing it in Tennessee, but Massachusetts may be overdoing the job.

Mr. DERTHICK. I have since 1953–54 traveled from 50,000 to 80,000 miles a year among the school superintendents with the school boards and schoolteachers of this country, and I never found but a few places where the staffing problem in these fields was not critical.

Mr. FRELINGHUYSEN. Mr. Chairman, would the gentleman yield? I think this is a very important question, the degree to which there is a problem in connection with science and mathematics teachers. I would like to phrase it perhaps in a different way because it has been a question in my own mind.

If we should assume for the moment that there is a shortage of teachers in the mathematics and science field because there are opportunities elsewhere, where they could get more money, and if we should make available Federal money to improve the pay of that category or those categories of teachers alone, do you believe there is any substance to the assertion that that would result in an undesirable distortion of the pay scales and lower the morale of other teachers and thereby create a Federal responsibility to assume some responsibility for all teachers' scales?

In other words, is this an opening of the door that we would not want to open?

Mr. DERTHICK. Mr. Frelinghuysen, I should be glad to answer that. It is a very significant question. It is one of the most significant questions that can be raised.

We have done a great deal of thinking about it and have talked to a great many people about it. First I want to say that I think the good teacher of English is just as important as a good teacher of mathematics or science, or the good 3d grade teacher is just as important as a good 11th or 12th grade teacher. I think they ought to be recognized as such.

This program does call for grants to the States on a matching basis with a good deal of flexibility, giving the States options of strengthening mathematics and science through supplying laboratories and equipping laboratories, or through supervision, or through developing better curricular materials; or if the State and local school district so chooses of making the salaries of mathematics and science teachers more competitive.

I am thinking of myself as a local administrator now. It does make one stop and think about the effect on morale and otherwise, this thing at which you are getting.

I went through the experience for a good many years of a similar situation with vocational teachers whose salaries had these supplements and who were paid above the rates of other teachers. It served as a tremendous stimulation on the part of the State and local community to bring the salaries of other teachers up.

I think in this program we have to consider what is a great critical national interest, and put our money at that point and expect the State and local communities to do the same thing.

I think the pressure would be there day in and day out to equalize the salaries of other teachers.

As a matter of fact if this legislation should be enacted I anticipate in the very first year there would be communities that chose this option which would bring up the salaries of other teachers out of State and local funds, and that that pressure would continue year after year. Also there are other ways of handling it. One might be in the way this extra money for mathematics and science teachers was utilized. Instead of being used to raise teachers' salaries or to employ additional teachers or to buy laboratory equipment or to provide more supervision, it might be used to give mathematics and science teachers extra duties for which they would be paid the premium pay.

It might institute summer school programs.

I had a recent telephone call from a school system in Pennsylvania, for example, that is teaching mathematics and science classes in an extra concentrated dose on Saturday mornings.

This would not necessarily mean that mathematics and science salaries were raised above salaries of other teachers, because there are so many other useful ways to spend the money than the salary supplements, particularly those that I have mentioned, and also I would stress the extra duty aspect on the part of mathematics and science teachers.

To turn your question one more way and to get specifically to another part of the answer, I cannot think that there would be any different pressure along the lines of your suggestion than there was with the vocational teacher. The pressure was all at the State and local level. I do not anticipate that this would stimulate a demand for Federal subsidies for other teachers' salaries while it was hitting this critical national need.

Mr. FRELINGHUYSEN. The question is what the results are going to be of a program in practice. But if it is the practice of meeting outside competition, it might be necessary to raise the salaries substantially in order to meet this outside competition and might well result in a distortion.

Your testimony seems to indicate that you do not anticipate any drastic increase in salaries along this line.

Mr. DERTHICK. In some places. I think that one of the strong features of this program is a flexibility that lends itself to adaption to the individual school system according to need.

Some school systems will undoubtedly find that to make the salaries of mathematics and science teachers competitive they do have to supplement those salaries, and they might supplement them considerably.

I justify that on the grounds of supply and demand and the critical national interest.

There are a good many school systems that have already been doing that in this country, paying these teachers more and realistically they have to face the fact that they either staff a classroom with a qualified teacher or they do not.

Then with regard to another concern of yours about whether we could raise them enough, I have had this experience over and over again. I have had a young man enter a teaching assignment in the school system full of ginger and zeal for teaching. During the course of his first year he will get married. Then about the next year he is expecting a child. The baby comes along and there is not enough

money to pay expenses. He then withdraws to take a job with business or industry at considerably more money.

Then I have seen salary rates for teachers go up. I can think of a young man now who came back twice to teaching because he preferred it to anything else at less money than he was earning.

I do not think by any means that we will have to duplicate the salary that industry is paying if we can give these fine people with their devotion to teaching a little better way of making ends meet.

Mr. FRELINGHUYSEN. Thank you very much, Commissioner. Thank you, Mr. Gwinn, for letting me ask the question.

I regret that I am obliged to leave. I enjoyed the Secretary very much. I did have a few additional questions that I wanted to ask.

Mr. GWINN. Mr. Folsom, I have here a statement of the National Society of Professional Engineers dated October 17, 1957, bearing on this ultimate question we have to answer: Is there a shortage, is there a demand that is not being met?

Among other things this is what they say:

Recently defense budget cuts caused the layoff of a number of aircraft employees including some 1,000 engineers. This resulted in extensive publicity to the effect that the shortage was over and that more engineers would be laid off as further cuts were made in defense spending.

As you know those cuts are now scheduled at $2 billion in certain areas. I will just read you a couple of paragraphs.

Special action * * *

I take it such as we are having now.

* * * to increase today's supply of engineers is not considered necessary or desirable since engineer enrollments—

Listen to this—

* * * engineer enrollments are at an all-time high and are continuing to increase. Artificial stimulation to further increase enrollments in engineering will severely handicap institutions that devote adequate attention to the capable students. We believe it would be more logical to assume that the controlling factors were priorities assigned to money and emphasis rather than a shortage of technical personnel in the United States. Emphasis should be made on quality.

There is a field, it seems to me, the United States Office of Education has not shown us the way. How are we going to get these schools that are not doing the job to perform.

Experience has shown that we have wasted engineering talent by using it at a level below that which it is capable of performing. Improved utilization of engineering talent can do more for an immediate need than any other single program.

Secretary FOLSOM. I might say, Mr. Gwinn, that we are not in this program concerned with the immediate problem of the shortage of engineers, scientists, or mathematicians. We are looking ahead for the long pull.

We know that the present situation is going to be met by the people already trained in these fields. We also know that the Office of Education has these figures on the enrollment to show that there has been a steady increase of enrollment in the freshmen class of the engineering schools. But a scientist takes a much longer time to prepare than an engineer. Most of them have to have doctors' degrees, and so forth.

We are basing this to a large extent on what the scientists them-

selves tell us and what the need is going to be in the future, in the next 10 or 15 years, in many of these fields.

The President said that the scientists are concerned about where we are going to be 10 years from now.

Mr. GWINN. Do you think that we are wise enough in any one spot, particularly in Washington, to chart this thing better?

Secretary FOLSOM. I think we are pretty well convinced that we need more scientists.

Mr. JOHN A. PERKINS. We do know, Mr. Gwinn, that we do have 400,000 fewer youngsters of 18 years of age than we had in 1940, although we have 40 million more people. If we keep that fact in mind and relate it to predictions made by the United States Department of Labor as to the kind of labor force this country will have to have 25 years from now, the indications are that our total working force will have a much higher percentage of professional and scientific personnel.

Therefore, if we are to meet that forthcoming variety of professional need and technical and scientific need, we have got to make the most of that short crop of youngsters born in the late period of the depression who are presently coming into our schools and colleges for training.

The shortages of scientists as of this moment really is not the point to be concerned about. It is how we are going to meet what seems to be an inevitable great shortage of the most talented youngsters in the years to come.

One other thing: We have 200,000 youngsters, good students, who have considerable capacity for college work, from the upper 25 or 30 percent of their classes, who are not going on to college. This statement was concerned about the quality engineer.

Assuredly if we are missing half the talent in the top part of our high-school classes, we are missing in proportion the top-quality personnel for our professions and teachnical programs available in the present generation of young people we are talking about. They are going to be the chief reliance of this Nation for its security and its economic growth.

Mr. GWINN. Of course, if we had the wisdom that you indicate that we have, we might prognosticate what we ought to do.

Secretary FOLSOM. Mr. Chairman, Mr. Gwinn, I would like to repeat again what the President said in Oklahoma City. He has a group of scientific advisers——

Mr. GWINN. We would like to know who they are.

Secretary FOLSOM. I can give you a list of them.

(List of the President's Science Advisory Committee referred to follows:)

PRESIDENT'S SCIENCE ADVISORY COMMITTEE

Members:

Dr. Robt. F. Bacher, professor of physics, California School of Technology
Dr. Wm. O. Baker, vice president (research), Bell Telephone Laboratories
Dr. Lloyd V. Berkner, president, Associated Universities, Inc.
Dr. Hans A. Bethe, professor of physics, Cornell University
Dr. Detlev W. Bronk, president, National Academy of Sciences
Dr. James H. Doolittle, vice president, Shell Oil Co.
Dr. James B. Fisk, executive vice president, Bell Telephone Laboratories
Dr. Caryl P. Haskins, president, Carnegie Institution of Washington, D. C.
Dr. James R. Killian, Jr., special assistant to the President for science and technology

Dr. George B. Kistiakowsky, professor of chemistry, Harvard University
Dr. Edwin H. Land, president, Polaroid Corp.
Dr. Edward M. Purcell, professor of physics, Harvard University
Dr. I. I. Rabi, professor of physics, Columbia University
Dr. H. T. Robertson, professor of physics, California School of Technology
Dr. Jerome B. Wiesner, director, Research Laboratory of Electronics, MIT
Dr. Herbert York, director, Livermore Laboratory
Dr. Jerrold R. Zacharias, professor of physics, MIT
Consultants:
Dr. Hugh L. Dryden, director, Medical Advisory Committee for Aeronautics
Dr. Albert G. Hill, Director of Research Weapons Systems Evaluation Group
Dr. E. R. Piore, director of research, IBM Corp.
Dr. Herbert Scoville, Jr., 2430 E Street NW.
Dr. Alan T. Waterman, Director, National Science Foundation

Mr. GWINN. I asked you some time ago to let us have the witnesses on the other side of the picture.

Secretary FOLSOM. I am talking about the President's scientific advisers. He said.

My scientific advisers placed this problem above all other immediate tasks of producing missiles and developing new techniques in the Armed Forces, the need for scientists in 10 years ahead. They said we need them by thousands more than we are presently planning to have.

I can give you the names of that group of advisers. I do not know of any other better source you can go to than these top scientists of the country.

Mr. GWINN. I will bet you will get top scientists who will probably take the other position, too—wouldn't they?

Secretary FOLSOM. I have not heard of them.

Mr. GWINN. These scientists indicate we have enough.

Mr. JOHN A. PERKINS. Enough today.

Secretary FOLSOM. He is talking about 10 years from now. He is talking about scientists. He is not talking about engineers.

Mr. GWINN. Do you think it will make much difference how many boys go into science and mathematics that the Government offers 10,000 scholarships? Are they not going to go in because they think there is an opportunity there and their parents and their advisers, the businessmen in that community, think there is going to be an opportunity for them if they do?

Secretary FOLSOM. These scholarships as I have said before are only a small part of this program. We do think that combined with the counseling and the testing the scholarship aid will create this atmosphere you are talking about of trying to develop more academic achievement, more interest in intellectual pursuit, and indirectly accomplish a little.

Mr. GWINN. Do you think it is not likely to overstimulate their interests and we will have too much on our hands?

Secretary FOLSOM. We are not concerned about that.

Mr. GWINN. They are concerned. They do not want to prepare for a field where there is no opportunity to get a job.

Mr. JOHN A. PERKINS. There is no vocational program in these recommendations. All we are doing is to encourage these young people, whatever their talents, to make the most of them, and then to make sure that their secondary school training and mathematics in science is such as will enable them, if should they want to, to successfully pursue in college a science and mathematics curriculum.

Mr. GWINN. I doubt our mathematical prognostications. Here is a perfectly good example. I think I will rest our miscalculations on this.

Constantly the educational societies, the educationists are emphasizing the fact that our teachers are leaving the teaching profession and those trained to teach science are going into industry. The statistics do not show that.

I do not know why they do not publicize these figures.

In the 1957 teachers' supply and demand report, the Journal of Teachers Education, March 1957, pages 41 and 42, showed that only 59.4 percent of the 1956 high-school science teachers' graduates had taken school jobs. The deduction there was that 40 percent of them went into industry. Here is what they did.

The other 40.6 percent are not in industrial jobs. The reports show that only 10.1 percent accepted other gainful employment. The remainder is divided as follows: Military service—the chairman was talking this morning—takes a lot of them, 6.8; homemaking, 2.1; continuing graduate studies, 9.3; now seeking teaching jobs, 1.1.

No information regarding 11.

That is not a story of a rush to industry. That is the story of preferring these jobs that we say there is a shortage.

Mr. DERTHICK. And yet, Mr. Gwinn, similar studies show that whereas only 60 percent of the graduates prepared to do science teaching go into teaching, that 80 percent who prepare for elementary teaching go into that kind of teaching.

So you see there is a difference of 20 percent on the side of restriction of science.

In other words, if we could strengthen mathematics and science as we propose to do, we do not see any reason why we should not get at least as many science teachers who graduate qualified in this field as we do elementary teachers.

Mr. GWINN. This had to do with science teachers.

Mr. DERTHICK. That is what I say.

Mr. GWINN. These were high-school graduates going into science teaching.

Mr. DERTHICK. College graduates go into science teaching.

But at the same time, Mr. Gwinn, 80 percent of the college graduates who prepared for elementary teaching were going into elementary teaching.

Mr. GWINN. That would not be a bad proportion, would it?

Mr. DERTHICK. Not when we have the shortages in science.

Mr. GWINN. That is the point. You have not yet shown any authority, it strikes me as authentic enough to offset the supply and demand principle that is working all the time, the unemployment that is working now, and the statement of the Society of Engineers itself.

Mr. DERTHICK. Does this figure about the District of Columbia impress you? Does this figure about California impress you?

We have another statement here.

There has been an alarming drop in the number of science teachers trained annually. In 1950, 9,960 qualified scientists graduated from our colleges. Six years later, 1956, 4,320 were graduated. That is a decrease of more than 50 percent.

Mr. GWINN. Where is that statement?

Mr. DERTHICK. We can give you the source of that statement as we did for the other. I suppose that would be in our degree study.

But you see in 6 years' time the number of qualified science teachers dropped 50 percent. You cannot overlook that.

Mr. GWINN. That is what we are scrapping about here.

You prepared a lot of figures on classroom shortages that some of us could not take. Since you have programs of your own we must assume that you are naturally going to try to support those programs. We would like to have the authorities of these statements.

Mr. DERTHICK. The source of that study is the National Education Association Research Bulletin, Volume 35 in No. 3, October 1957, page 113.

Mr. GWINN. National Education Association is interested in getting Federal Government help in education, is it not?

Mr. DERTHICK. I think there are a good many people concerned with strengthening education. You refer to our figures on the classroom shortage, Mr. Gwinn. I can only remind you of the statement Mr. McCounell made to you after 2 days of our testimony. Do you remember that he indicated to you that you had him worried by your comments, questioning the Office of Education studies.

In a very kindly way he wanted to tell you that after listening to 2 days of our testimony he was convinced that we were very conservative and that you had better take our figures because if you got the real facts it would cost you a lot more money.

Mr. GWINN. I remember how bad his judgment was at that time.

Mr. DERTHICK. Mr. Gwinn, you have from time to time commented on the poor quality of the work being done in schools today. I have quite a few sources here that would reassure you, if you would like me to give them to you.

Mr. GWINN. I have been in education too a good deal of my life, and I think we are doing a wonderful job in some places. We are not talking about them, are we? We are talking about the places where we are not doing a job.

Mr. DERTHICK. That is just the point of our program. We want to spread these good practices to more places.

I have a great deal of evidence here that is very reassuring to me about the quality of work that we are doing in our schools.

Mr. GWINN. I think we would certainly like to have that, Mr. Chairman.

Mr. WAINWRIGHT. Why not wait because he is going to follow the Secretary.

Mr. GWINN. I was citing you some facts regarding the President of Yale. Before you go on, let me give you one other case, and then I think I will stop.

This is another applicant for Yale. This is a letter the president received.

I have a letter in this morning's mail, one from a teacher in French in a public school in a nearby State.

This would be in New England, I suppose.

She has just been called before the principal who has in his hand a letter from a superintendent of schools in which letter he says: "Your French teacher's students have been doing better than the national average. It is not a good

thing. You had better slow up." Our unfortunate French teacher who happens to have been born in France said: "Up to this point no one has ever scolded me for doing my work too well. The situation is so novel that I do not know where I am. Please, Monsieur, can't you help me?"

The CHAIRMAN. Will the gentleman yield?

Mr. GWINN. I yield.

The CHAIRMAN. What is the citation for that?

Mr. GWINN. This is the same I cited before, January 24, 1958, U. S. News & World Report, page 77, from President Griswold's article.

Mr. DERTHICK. I was just going to comment on that case, if I may, Mr. Chairman.

Are you ready?

I think of course it would be ridiculous for any of us, principals or superintendents or school board members, to devaluate or discount quality. We all want quality. I personally would like to pin a medal on that French teacher.

I cannot resist saying, however, that having dealt with lots of people as a superintendent of schools, teachers, principals, and others, I imagine that there are some facts missing from that report, not with any dishonest intentions at all.

I cannot conceive that such a thing could happen. I imagine there is a misunderstanding somewhere along the line. I imagine that principal would be very much astonished to read that letter.

Mr. GWINN. He will have a chance to read it.

With this I am going to stop, Mr. Chairman. I think fundamentally that the more we try at the top, at this level artificially to affect this stream of education that we have on a free basis in 55,000 school districts, the more emphasis or underemphasis we get, the worse off we become by the sheer force of the Government trying to correct the situation that it really has no power to correct except with money. We find that a very uncertain correcting evil, shall we say.

Mr. DERTHICK. We feel that one of the great strengths of this program is that it puts the responsibility on the State and local communities to do the job.

Mr. GWINN. I think there you are guilty of a very unfair thing because you are going to give scholarships in some areas that are not entitled to scholarships and you know it.

This is a political peddling around of benefits. The same old peddling that we are doing in so many other directions, whether it be in making corn or making scientists. That is very unfair to the States that have to spend their money to educate and at the same time spend their money on some other school system that is not performing.

Mr. DERTHICK. Mr. Gwinn, I would disagree with that very vigorously. It leans over backwards to be fair to all young people wherever they live. If a young person is unfortunate enough to live in a community where he has a very poor school and he has a superior aptitude, then this program can pick him up. It would be bad for him and both wrong and unfortunate for the country if his fine set of brains was not picked up and developed to the maximum.

Mr. GWINN. There is another assumption, Mr. Derthick. I think it is a wild assumption. You say that we have got a lot of boys that are not getting an education because of lack of money. You cannot prove that.

Mr. DERTHICK. I was not talking about money there. I was talking about brains. I was simply saying that brains, superior brains are not confined to the economically favored parts of the United States.

Mr. GWINN. I know. I have lived in communities just as you have all my life and I have been close to the schools and I do not know of a single boy in my community of superior quality that you talk about that has been deprived of a college education if he wanted it. I doubt if you do either, do you?

Mr. DERTHICK. I disagree with you on that, but I do not believe that we are going to make any progress with each other on that point.

Mr. GWINN. I agree with the chairman here, there is something of value here to come out of this boy wanting to go to college, desiring to go, to the extent of being able to spend his own time. I think your philosophy is wrong because it assumes that money will supply that desire.

The CHAIRMAN. The gentleman from Arizona, Mr. Udall.

Mr. UDALL. Mr. Chairman, I know this must be a complex thing though invigorating experience for these witnesses because at one moment they are defending themselves for having the nerve to come up with anything at all, and in the next moment I confess I am going to take a slightly different attack, we are inquiring as to the dimensions of the program and the sufficiency and so on.

As one of the members of the committee I want to say I do welcome these proposals and I know the Secretary and his assistants have put in a great deal of hard work on them.

I have some mixed feelings about some aspects of that that I want to explore for just a moment.

Taking the total educational picture today, Mr. Secretary, is it your feeling that the educational crisis and problems are deepening or are we in a picture that seems to be improving as we go ahead?

Mr. Gwinn perhaps will not agree with me that there is one.

Secretary FOLSOM. It is pretty hard to answer that yes or no. I think we are making progress in some areas, but we have to look ahead for the future when we have this tremendous increase of college enrollments facing us. I think we have got to do a lot of things to get ready for that.

I would say on the other hand, if you take the situation now and compare it with 10 or 15 years ago we have made good progress. I think we have a number of these critical problems facing us now. If we do not do something about them now, the situation will get worse.

Mr. UDALL. Certainly the fact that the college enrollments are going to double within the next 12 years is a disturbing thing and one that challenges, does it not?

Secretary FOLSOM. It certainly does.

Mr. JOHN A. PERKINS. In this connection we have a very fast-changing scene here in which within a half a decade we are given diametrically opposed problems, you might say.

We are now confronted with a generation which is the smallest college-age generation we have had in almost 20 years. So the problem becomes one immediately of harvesting as many of that group as we can.

Within 5 years we shall then be confronted with the overwhelming numbers who will be presenting themselves for college entrance which

confront the educational scene more with institutional problems. The institutions perhaps will be overwhelmed instead of being confronted as we are at the moment with an individual problem in which the problem is simply one of helping the individual to make the most of himself for the good of society.

Mr. UDALL. I think it is very well that we keep that particular aspect of it in mind because it is very important in the immediate years ahead.

I find it difficult and interesting that it was noted in the Secretary's statement the total amount being spent approximately this year is $16 billion for schools and we are proposing $225 million. And this figured out is just a little over 1 percent of that total. I find therefore that I am not at all persuaded as my colleague is that this is some massive invasion by the Federal Government in the field of education.

That brings me to the second point that disturbs me most. I think one of the very good features of this program, and the one that makes it unassailable on the point of Federal control, is that you are leaving the details of these plans, with general guidelines laid down, in State and local hands. I think we can all agree that is where the responsibility belongs. And I am personally of the opinion that in the last 3 or 4 months there has been more ferment in the school circles at the local level from the standpoint of analyzing curricula, attempting to determine whether our people are adequately paid and so on, than we have had in a long, long time in our country.

It is that point that I want to discuss, because I think those decisions have to be left at the local level.

But we are laying down guidelines. We are gearing our program as to science and mathematics both as to scholarships and to aid.

I want to ask this: trusting the judgment of local school boards, of local people, of local educators, if we simply directed that the funds be spent in the national interest, to further the national security and so on, without mentioning science and mathematics, could we not pretty well be assured that we not only would eliminate the objection that this program is lopsided and imbalanced, but that we get substantially the same results in that the judgment of the local people would carry out pretty much what you people have in mind in proposing the program?

Secretary FOLSOM. As I stated in my statement here, we cannot always assume that the local school board is going to look at this from the point of view of the national interest. I think that would be quite an assumption. We hope it will be the case, but we cannot be sure of it.

I might say our scholarship program is not only for science or mathematics. The youngster can take any course he wants to after he gets the scholarship. Many of them probably will take other courses than science and mathematics.

Also the other part of the program, aid to graduate schools, is across-the-board, aiding all teachers in all fields. Of course the foreign languages are quite different from mathematics and science. It is limited only in the part having to do with great aid to mathematics and science. There we think there is a close connection with national security. We also feel that in recent years we have gotten a little off balance by not giving as much mathematics and science as we should.

With the great scientific developments we ought to be giving more courses in science and mathematics.

So it is really restoring the balance that we are trying to do here. We do not say this is going to detract from humanities, because I think it would be a big mistake if it did deflect people from other courses like English, history and government.

Mr. UDALL. It might be that you feel there has been an imbalance. There has been an existing one that needs to be corrected. I personally have the feeling as I see the Congress warming up to its work here that those for instance who feel that the race for survival is the race for missiles might be quite mistaken. Although that is very important and that probably we need more Einsteins in the field of science, we need some Einsteins in the field of human affairs. Indeed, the best scientists that we have today in my opinion are the people who are scientific statesmen in the sense that they know and are interested in the problems of peace as well as studying and ascertaining the secrets of nature. You know the types I am talking about. They want to know and understand about human nature, too.

Secretary FOLSOM. We certainly would agree with you there.

Mr. UDALL. I am somewhat concerned. I want that concern allayed if it can be, that we might tend to become lopsided. We might forget and put forward a program which in itself creates not only an imbalance in our educational system, but in our attitude and approach on the great national problems ahead of us.

Mr. NICHOLSON. Do you want an answer to that question?

Mr. UDALL. I am asking a question of the Secretary, if I may.

The CHAIRMAN. Does the gentleman from Arizona yield?

Mr. UDALL. I will yield, yes.

Mr. NICHOLSON. I would like to ask you if you think it is proper for the Federal Government to come into my town and tell us what we are going to pay the schoolteachers?

Mr. UDALL. I do not as I conceive the bill. I do not think anyone has proposed that be done. I think they are leaving it up to the school boards and parent-teachers associations to decide what to do.

Mr. NICHOLSON. The magazine writers and commentators bring that up. Every superintendent of schools has written me under the impression that if these bills go through that they will get more money.

Mr. UDALL. They will get more than money, but they will not be told what to do with the money except in a broad general way.

Secretary FOLSOM. That is right.

Mr. UDALL. That is my conception of the program being put forward.

Let me explore one other problem and then I will conclude. I wondered, and I am asking for a candid opinion; maybe we should not be too candid about it. We are all agreed generally there was a serious emergency need for a school-construction program. We did our best and we lost it by a narrow margin in the House last year.

Now apparently, Mr. Secretary, you and the President are not going to propose that program. Is the reason because of the defeat and you don't feel we can put it through Congress or state that you feel that this new program should have a higher priority?

Secretary FOLSOM. We feel this program has a higher priority, but, of course, in making the decision, we would have to take into account the fact that three times the construction bill was proposed, it was defeated.

As we have already stated, we feel this has a higher priority in view of the present situation.

Mr. UDALL. Of course, I personally regret that you do not plan to present both programs to us, because it was my feeling that the events of the past few months might give us an extra impetus to pick up those few extra votes we needed and I hope that you might reconsider that decision and we might have a crack at the school-construction program.

That is all I have.

Mr. ELLIOTT. The gentleman from New York, Mr. Wainwright.

Mr. WAINWRIGHT. I would like to carry on right from where Mr. Udall left off in regard to the program, because I joined last year with the more conservative element of this committee, and this year—do you want that in the record, Mr. Bailey—I find myself very much in sympathy with this bill and with the program, and after studying it in some detail and discussing it with people like Mr. Powell and yourself today at lunch, I see no reason for me to introduce the question of segregation into the problem, because I do not think it fits this kind of bill.

However, I think that if the proposal suggested by Mr. Udall would recur, it does fit into a school building type of bill, even in the light of the Supreme Court's decision, which is not affected here by what you have proposed or, as I see it, by what Mr. Elliott proposed several days ago.

But specifically, I have some questions by Mr. Frelinghuysen—which, after 3 years we are working together rather than opposite sides of the fence—he has left with me. These are mutual questions, I might say.

One of the things that we are interested in is why there is a per capita allocation of funds rather than a needs test. I do not believe we got a direct answer from you, Mr. Secretary, because we were discussing it with your Commissioner of Education a few minutes ago.

Secretary FOLSOM. Since we look upon this as a bill to stimulate activity rather than a broad aid bill to education, we don't think the needs test should necessarily apply because there are some States that might already be doing a much better job in this field, although the per capita income might be low. Since so much of it is stimulation, we feel it ought to be on an equal basis so that everybody could achieve the same.

Mr. WAINWRIGHT. One other feature that will come up here and in the Senate, and I discussed this with Nelson Rockefeller earlier because he has peculiar knowledge along these lines, and going back to what Mr. Udall says, some people say this is insufficient and others say it is not necessary at all, but if you take either the 10,000 figure or 40,000 figure of total scholarships, and you add this to the existing financial burdens of the universities, you will find almost unanimity among the corporations, the Harvard overseers, the various presidents and trustees of organizations, that additional scholars brought to them by scholarships at this time is going to create one heck of a burden.

Supposing you get a thousand dollars out of a scholarship or if they are able to scrape all together to pay a tuition of $1,500 from one source or another, it will cost them hypothetically $3,000 to educate that student. Who is going to make up the $1,500 from these additional scholarships that are going to come forward?

Secretary FOLSOM. We know that is a serious problem that we are going to be facing in colleges in the next 10 years. But this program of ours, with the small number of scholarships involved, we do not think will create a very serious problem with the universities. It is a pretty small percentage of the total number involved. We want to make sure that these able youngsters get there and we think there being such a small percentage of them, it would not increase the problem very much. But something has to be done to meet this general problem of where the colleges are going to get this money. Of course, many colleges are going out now raising money just for this purpose.

Mr. PERKINS. Full-cost scholarships would not be the most economical way to aid the colleges, which is a problem which is continuously confronting everyone associated with them. To do so would relate the aid to the institutions to the choices of these youngsters who are going to get these scholarships and where they decide to go to school. Some of them may decide to go to schools that are very hard up indeed, but a majority of them might decide to go to schools that, relatively speaking, are fairly well financed.

If we were to proceed to aid the institutions rather than to aid the students, which is our concern here, we would distribute that aid in other ways than to pay matching grants related to scholarships. But the problem we are presenting to you is largely an aid to the student rather than to the institutions.

As the Secretary just said, there are not so many of them that it is really going to break the financial back of many of the institutions affected.

Mr. HASKELL. You offer 10,000 scholarships, and then both political parties will put in their platform we are for 20,000 next year or 30,000, or we may have to compromise with our friends on the other side of the aisle on your bill and end up with a higher figure, at which time there will be an impact on the colleges, at which time somebody has to face the problem of what are you going to do about it.

Mr. PERKINS. If you were going to aid the institutions now as well as the scholars, you would only increase that likelihood of enlarging the scholarship program. You would combine not only those who would like to have the scholarships in greater number but also the institutional enthusiasm for scholarships would be added to it.

Mr. HASKELL. In a short time, in 2 or 3 years, the colleges are really going to be faced with a tough situation and a lot of people are going to be eliminated. I assume people will be eliminated, probably, on the basis of their qualifications. At some point, it seems to me, you are going to have to come up with a recommendation on what to do about it. Do you have, in the next year or so, plans to come up with recommendations?

Secretary FOLSOM. Of course, we are studying it all the time.

Mr. WAINWRIGHT. I would like to stay with this just a minute. Suppose, and I hope there will be, some kind of compromise is worked out in this committee and eventually passed, and supposing that includes a large scholarship program in terms of numbers, I think we have to have help from you and we have to have help from those proposing it, how are the colleges themselves going to be able to stand, economically, the burden of these additional students?

Secretary FOLSOM. Dr. Perkins, being president of a college, I think can answer this.

Mr. PERKINS. We are very mindful of just the points that you gentlemen are bringing up. For instance, it was asked at the outset of these hearings where these proposals came from, and there was some association with sputnik and what was being offered. Really, these proposals, perhaps, had their greatest impetus out of the work of the Committee of Education Beyond the High School which the Secretary and President created many months ago, with the help of the Congress. A task force headed by Mr. Derthick was created to follow up on the recommendations of that Committee, which were finalized last July, I believe.

As I mentioned to Mr. Udall, this problem breaks itself down to two time dimensions. The first problem is that growing out of the shortage of manpower, which the present generation of college students presents. That shortage, it seemed to us, dictated a scholarship program. Now, 4 or 5 years hence, we are going to have, perhaps, a plethora of college students. Being an educator, I would question whether we do. But, by comparison at the present moment, by that time the need for aid will no be for the student but, rather, for the institution.

Therefore, in presenting programs to you now, it would seem unwise to present a college-aid program, that is, institutional aid program, and at the same time we are mindful of that, and that brings me back to Mr. Gwinn's thinking, and others, why we had arrived at the number of scholarships we did. We were not contemplating an all-out scholarship program here, but simply a scholarship program of such proportions as to stimulate private sources and other sources to make scholarships available, such as State legislatures. At the same time, give an insurance that we would not by our own program for counseling and guidance, be encouraging youngsters to go on to college and then leading them up to that ambition without, even with their own effort and their parental effort, actually being able to go to college at all. Therefore, from what I have said, you can see how we get to our present number of scholarships and why we have a rather restricted number.

And, personally, I would counsel against going overboard on scholarships and creating a situation where all one had to do was express an interest and get a Federal scholarship, because that would work a tremendous hardship in a very few years on the colleges and universities, which will already be overwhelmed with young people who can come to college out of their own family resources and their own personal earnings.

Mr. ELLIOTT. I have just calculated here the impact of this scholarship program on my State. As I figure it, the program will result, if enacted, in 207 scholarships for Alabama. We have some 20 colleges, maybe 22 or 23, in Alabama. I do not have the exact number, but I can think of about 20. That would mean, roughly, an average of 10 students per college. I thought that information might be appropos of the point you just discussed.

Mr. HASKELL. The only thing that bothers me is the fact that there is not enough identification of the most gifted student. I recognize the reason is probably you do not want to exercise any more control

with the States, but there is a real possibility that many of these scholarships will not go to the most gifted children. Or do you think that is not true?

Secretary FOLSOM. I do not see why a State plan, if it is developed along the lines that we had in mind, would not reach the ablest youngster if he needs it, because we are taking into account the tests. We would all have statewide tests, and we would all go by the school grades and things of that sort. It is not going to be easy, for instance, in Alabama, for a State scholarship commission to select 207 qualified youngsters. He will have to be pretty good to get one of those scholarships.

Mr. HASKELL. Do you have any example where this has been done in the States before?

Secretary FOLSOM. The National Merit Scholarship plan is a good indication. That is a nationwide plan.

Mr. HASKELL. The results of what the children have done afterward.

Secretary FOLSOM. It has not been in effect long enough to check on what they have done. We will have to have a long period of time to prove that point.

Mr. WAINWRIGHT. Mr. Secretary, to go on to another phase of this, have you had any reaction from the commissioners of education or governors or lieutenant governors, of either kind, either a chip on the shoulder—we do not want the Federal Government to come in with any ideas whatsoever in regard to what we ought to test our children with, or the converse approach, stating, "Yes; we are delighted to have the Federal Government pay half, and we are devising a test right now."

Secretary FOLSOM. In the various conferences we had before we developed this program, we talked to quite a few chief State school officers, and also the school superintendents in various cities and the officers of various educational organizations and others, and we found, in general, that they were quite sympathetic to this part of the program.

I might say that we found that, in many cases, however, while they liked the program as a whole, many of them would like to see more money in different aspects of it. And some of them liked one feature better than they liked the other feature. As I recall it, and Mr. Derthick can check me up on that because he spent more time with them than I did, we found that there is no opposition to this part of the program to speak of. Is that true?

Mr. DERTHICK. The opposition would have come, had we planned a nationwide testing program, and I would say it would very properly come. We would be the last to want to see that. But with a testing program that is administered by the State and local authority, we have not found opposition to that.

Mr. WAINWRIGHT. Admiral Rickover would have said that that is just what you should have done.

Mr. DERTHICK. Yes.

Mr. WAINWRIGHT. I have no further questions.

Mr. DERTHICK. I would also add, Mr. Haskell, that I have complete faith in the competency of the State scholarship commissions to find the more able students who, at the same time, are needy. Nat-

urally, some might slip through their fingers, but I think they will do a good job of identifying the most able.

Mr. HASKELL. In other words, you think they will keep politics out of the program?

Mr. DERTHICK. I don't anticipate politics getting into the scholarship program.

Mr. JOHN A. PERKINS. In our own State of Delaware, where we have quite a large scholarship program with money provided by the State, administered by the university, we have had no trouble in people trying to bring to bear political pressure on the university authorities in the distribution of scholarships. They are distributed as this bill proposes, on the basis of need and ability.

Mr. DERTHICK. You see, it would be quite a different thing. I would not want to be a member of the State legislature and be assigned so many scholarships to award. But these scholarships will be awarded by scholarship commissions.

Mr. NICHOLSON. Mr. Chairman.

Mr. ELLIOTT. The gentleman from Massachusetts.

Mr. NICHOLSON. You must have taken into consideration that the colleges now are overloaded; that a boy or girl wanting to go to certain colleges in my State finds there is not any room for him or her Now, what are we going to do about that? It is so, is it not?

Mr. JOHN A. PERKINS. By and large, Mr. Nicholson, I would not say as of this date that the colleges of this country are overloaded. There are some institutions—and I think perhaps more of them in your State than any other—with great reputations and very great prestige, and those colleges are having applicants far beyond what they can take care of.

The financial circumstances of the country having been pretty good, it means that a lot of people can send their youngsters to more expensive institutions. Then, too, those same colleges, many of them, have very extensive scholarship programs and they have been able to go about the country and attract to their institutions through those scholarships some of the very best youngsters wherever they may live, and this has kind of crowded out in a sense the people who traditionally go to those schools: the people living nearby, and the sons and daughters of the people who graduated from those institutions.

But there are many other colleges over this country which would be much more efficient had they had twice as many entering students this September as they had. Their cost per student is very high simply because they are operating at less than full capacity or less than a thousand students, which some authorities think to be required of a liberal arts college in order to have a good offering of subjects, and at the same time teach those many subjects with a sufficient number of students in each class to make the teaching economical.

So I do not think that we could say, in all fairness to the situation, that our colleges of today the country over are overcrowded.

Mr. NICHOLSON. Well, I know of several instances where a girl or boy had tried to get into three different colleges in my State, and they could not take them. Whether they did not have the room or the teachers or what, I do not know. All I know is that in the State that I come from—and I suppose every State has different laws—the State does not have anything to do with the schools at all, prac-

tically nothing except the State teachers colleges and the State university. The rest of them are all privately operated and the towns and cities appropriate the money to run those schools.

Now, my town has gone up four times in 10 years; it has gone from a little over $100,000 to $400,000. That has nothing to do with the school buildings that we have built. We have a population of around 7,000 and we owe a million and a half dollars for new high schools, a junior high school building. If anybody is going to be helped, it is a town like I live in. But we have doubled the teachers' salaries, for instance, in the last 10 years, and we would object in a town meeting to have the Federal Government come in and say, "Well, we are going to give you $100,000 for teachers' salaries, but you have to get them up to a certain limit before we do," and that is what you will do.

Mr. JOHN A. PERKINS. No.

Mr. NICHOLSON. If you do not, then you get it to these cities and towns who can well afford it, and the poor ones will be worse off than they were before. That follows as the night follows the day.

Mr. JOHN A. PERKINS. If the State of Massachusetts got so many hundred thousand dollars to aid science and mathematics teachers, and it wanted to distribute, as I presume it would, that money over the State of Massachusetts, your town school authorities could decide that they wanted to improve the salaries of its mathematics and science teachers. If they are now paying them $4,000, they might have money enough to pay them $4,400. This might be enough added incentive for some of the young people who would not otherwise teach mathematics and science to decide to stay in teaching, rather than go on and work in some of the industries in your area.

Another community might be paying $4,800, and they perhaps would not have the incentive to put that money into teachers' salaries. Maybe they have too many youngsters in one room for good teaching. They could decide to hire several more mathematics teachers and cut down the student-teacher ratio, thereby enabling them to have better instruction. Or still another situation might be that they did not have an adequate laboratory in some neighboring town of yours, but they felt their teachers' salaries were sufficient to enable them to get qualified mathematics teachers. They could put that money into a chemistry laboratory such as Chairman Barden was talking about this morning.

That is the way I would contemplate this would work.

Mr. NICHOLSON. We have been told how far the Russians are ahead of us in mathematics; that they teach their children for 12 years, and then they are qualified scientists and everything. But we also teach, or we did teach, unless the educational system has fallen down, we taught mathematics from the day we entered the primary school until we got through in the grammar school, in every single grade; then we go to high school and we take up algebra and then we take up geometry. In the third year we take up algebra again, and in the fourth year we take as far as trigonometry sometimes, if you have the right kind of teacher there, the ones that want to take it.

Now, I think our children get as good or better education than they do in Russia. Every time you see anything on the radio, and they have to have an interpreter if it is some Russian—most any other nation in the world talks United States, English, grammar or something. I do not know what you want to call it.

I do not think we ought to do these things unless there is a way out of it without the Federal Government having anything to do with it whatever. You are taking away the things we have been used to for 300 years.

Of course, the educators about 30 years ago started a new system. Instead of reading, they showed you something and said, "That is a cat" or "That is a dog," instead of getting A, B, C, D, E, F, G in your tables, whereas the kid that got out of the intermediate school did know his tables, up to 12 anyway, and that is pretty good.

So if we pass the bills on the propaganda that is being put out, I do not know by whom, then we might as well close up shop and go home. Because we believe in this country and the institutions that we have been proud of, and we are certainly proud of our educational system, in my State anyway. You find very few wooden buildings, but you go through Vermont and New Hampshire and go into Canada and see what their ecole is. It is just an old wooden place. It is not a fit place for children.

The Canadians, I think, are just as smart as we are and they are a good deal smarter because they have balanced their budget, something that we never do. So when they talk to me about the fact they do not get it, it is not the fault of the people in this country, it is not the fault of the educators; it is the fault of the fathers and mothers who send them there and let them take the easy courses, get their 20 points so they can graduate and get their diploma.

You know—perhaps you do not; perhaps you are not old enough—but I know that we were pretty well-founded in reading, writing, and arithmetic. There was no question about it. We had to take these subjects, too; it was required to take mathematics. It was required to take history. It was required to take English. And it was required to take Latin or French, either one or the two. I took Latin and lasted about 3 months. French was easier. Those things were required.

Now they go up and take up—I do not know—anything, bookkeeping. They certainly do not take reading. And I am sure they do not take up writing any more in school because if you were a Congressman and get the letters that I get from the young people, you would not feel too good about it. So I think that the place we should begin to take care of these things is at home, and have your department or the State Department go out to the women's clubs and everything else and show those people the advantage of taking these required subjects. It is an educational job in itself and should be carried out that way. Then you can appropriate all the money you want to. I think it will be well used.

I do not know whether you know it or not, but I bet you a dollar maybe with the army of schoolchildren we have, maybe twelve or fourteen hundred, that neither their father or mother has ever been inside the school while they were in there. I mean after we graduate from high school we go to college or do not go to college. We certainly never go into any elementary school again or any intermediate ones. The fathers and mothers do not either. They trust the school committee in the town that runs it.

I am not asking you to change your mind or anything, but an educational system that will teach the father and mother the advantages

of these kinds of subjects that you want them to take will be of great help.

Mr. ELLIOTT. I recognize the gentleman from West Virginia, the chairman of the Subcommittee on General Education, Mr. Bailey.

Mr. BAILEY. Mr. Secretary, I listened with undue interest to your presentation at the morning session of the committee meeting. I want to commend you for the able manner in which you backed up your proposals.

You will recall when your program was in its formative stage, you spent an hour with me running over the possibilities of what might be included in this legislature, and at that time I made the remark that I thought you were going in the right direction, but I questioned the adequacy of the amount of money you were going to spend.

Do you recall that?

Secretary FOLSOM. Yes, sir.

Mr. BAILEY. I am still of the same opinion, that the biggest weakness in your proposal now is the lack of financial support for what you are trying to do. I was interested particularly in your saying that there was an annual loss of bright pupils, that is the mortality between the high school and colleges, of some 200,000 youngsters. Now you are proposing here to grant scholarships to, say, 10,000 of those. I am interested in the other 190,000. We might have an embryo potential president in that other 190,000. I am interested in just what we are going to do about those if they are a bright group. You see, you are hardly scuffing the surface of the problem unless you are putting it on as a demonstration.

Secretary FOLSOM. Of course in some parts of our program, additional money would not help an awful lot. We think we have adequate funds for the testing and counseling and guidance.

Mr. BAILEY. I note you state your program is to be temporary. You are assuming that at the end of 4 years the Government is going to get out of this picture?

Secretary FOLSOM. Since this is a stimulation program, we are hoping that the States and local governments will pick up from that time and continue it on after we once get it up to this level.

Mr. BAILEY. Is it safe for me to assume that your assistants here are going back before the committee so that there will be someone to go into the details?

I have missed most of the questioning today. I had some business on the floor.

Secretary FOLSOM. The Commissioner has not presented his statement yet. He was going into the details in his statement.

To get to the question that you asked before about scholarships, we realize that 10,000 is a small percentage of 200,000. Many of those 200,000 can go on to college without scholarships. Also, there are scholarships available from other sources.

We hope and anticipate that this program of ours will stimulate many other scholarship programs and increase those that are already in existence because many scholarships now are not adequate They are only two or three hundred dollars, when many youngsters would not be interested in that because it takes care of such a small part of the college expense.

We also anticipate that many other people, corporations, individuals, foundations, will grant more scholarship programs.

Mr. BAILEY. May I inquire at this point, if legislation is drafted, in the event a situation like this develops, you are providing for the setting up of selection committees within the State, no Federal control over them?

Suppose the State went far enough to cooperate with you in the selection and setting up of that committee, they might pick their State board of education or the regents of a university, or they might set up a separate group, but the legislature, on account of financial difficulties in the State, failed to provide matching money, is your leigslation broad enough that gifts or donations by foundations or individuals could be substituted for State financing activities?

Secretary FOLSOM. It could be. I don't think it does, though. As far as the scholarships are concerned, they are 100 percent paid by the Federal Government.

Mr. BAILEY. I understand that.

Secretary FOLSOM. There is no matching on the scholarship.

Mr. BAILEY. I am talking now about your selection of your 10,000 youngsters.

Secretary FOLSOM. You mean the administrative cost on a matching basis; but the scholarships are paid for entirely by the Federal Government.

We do not think many States who would like funds would have difficulty in getting matching funds for administering this scholarship program. It would be a comparatively small amount.

Mr. BAILEY. There is considerable correspondence coming to my office, from educators outside of this particular legislation, in which they are questioning the advisability of going as strong as you are going in the field of science and technology and ignoring some of the other phases of education.

How serious is that objection coming to your office? Enough to warrant that the committee take it into consideration?

Secretary FOLSOM. I think we have found that when we explained our program in full to many of the educators we talked to, and they are just as much interested in the humanities as anyone else would be, that they seem to be thinking we have it pretty well balanced. We are really trying here to restore the balance, as I indicated before, that we once had, because we really have gotten out of balance when it comes to teaching science and mathematics in high schools, and probably also elementary schools.

We also realize that an educated man in the future has to know quite a little about science if he is to be educated. He must get this much, and some of them, if they do not get it in high school, will not get it at all. We do not find many of these educators who feel that we are going to give too much emphasis to mathematics and science, especially since the other parts of our program are across the board, not directed just to science and mathematics.

Mr. BAILEY. You realize, Mr. Secretary, there will be some delay in getting this program into operation.

For instance, in my State we are talking now about the possibility, at least your argument, I do not know what the legislation provides, it will be possible for them to pay increased teachers' salaries in the field of science.

You run into a number of States, in my State particularly, that have a standard salary schedule set up by law. It will be necessary for our legislature to change that classified salary before you could give higher salaries to teachers in science.

Secretary FOLSOM. As you know, we have made it very flexible; leaving it up to the States how they will use the money so long as it is used to pay teachers' salaries.

Mr. BAILEY. I believe you said you were going to use $110 million pretty much at the discretion of the State authority, and I trust the local authorities, for adjustment of salaries, and you have stressed particularly the acquisition and the installation of additional equipment for teaching the sciences.

Unless there is some restriction on that State—in that case let us confine it to the State—there will be a tendency there to continue to send out a small amount of money because my State would only get a small part of your $110 million that you are distributing for that purpose. So it would result in their discontinuing to send out a little more money than they are sending out under the State-aid program and it would not concentrate that teaching in a single point.

I think you and I discussed that when I pointed out that my home county had 12 first-class high schools in it. If there was some way we could pick out one of those high schools, it would be much better to transport the pupils from the other 11 to a central high school that had everything possible in the way of equipment for teaching that rather than for them to continue to send it out and all 12 of them would try to qualify.

Secretary FOLSOM. That is a very good point. We are hoping that is one of the things that would come about, also consolidation of districts, because some of these small schools cannot support——

Mr. BAILEY. In this instance, I mentioned none of them is more than 20 miles apart.

Secretary FOLSOM. That would be a very good outcome of this. As far as the grants are concerned, of course, you realize it must be new money we are matching. They cannot get it from existing funds.

Mr. BAILEY. That is true, and I realize that you would possibly be getting into the field of Government interference.

Is it your thought that no restriction of any kind whatever other than accounting for the fact it was expended will be required in these grants to the States?

Secretary FOLSOM. We have made provision for a plan which will be submitted to the Commissioner, showing in a general way how the money is to be used. It must—I think I read before the specifications of the plan—the plan must set forth procedures to be followed in using the money either for employment of additional teachers or for increase in the salaries of the present teachers, or for laboratory equipment. As long as they assure us it is for that purpose, and they certify to that effect, we will okay it.

Mr. BAILEY. You mean that plan must be submitted before the grant is actually transmitted?

Secretary FOLSOM. Yes.

Mr. BAILEY. Is this grant going to be directed to the group that is set up by the State or is it going to be to the treasury of that particular State, the fiscal officer?

Secretary FOLSOM. It goes to the State education agency.

Mr. BAILEY. Those are the things I had in mind when I asked you if your assistants were going to bring it out more in detail.

Secretary FOLSOM. Yes. We can answer that right now.

The payments to such State under the program of local educational aids are approved by the State educational agency under the State plan. It is approved under that section.

I might say that we have a table here that shows, that of the $10 million we are granting directly to the States for them to have instructors going around helping the local schools and improving the science and mathematics, West Virginia would get $152,000. The local educational agencies would get $1,519,000.

Mr. BAILEY. My State would get that much?

Secretary FOLSOM. Out of the $100 million you would get $1,500,000.

Mr. BAILEY. I appreciate knowing what our part of the kitty would be, but I still think it could be used to better advantage if it were concentrated in some strategic school rather than scattered.

Mr. JOHN A. PERKINS. If the State plan made that provision, that would be possible.

Mr. BAILEY. Well, I will make it my business to talk to them if this legislation goes through.

Secretary FOLSOM. If the State agencies found that certain schools did not need it and other schools did, they there is no reason——

Mr. BAILEY. One other point and then I shall conclude.

I was interested very much in the exchange of ideas between your assistant, Mr. Perkins, and Congressman Wainwright, talking about the merits of this proposal to increase the teaching of science and technology in the schools.

I have in mind the fact that the people are growing intensely interested and that is largely due to the propaganda and the news and information that is coming over the television and radio about our serious situation brought on by Russian developments. There is an intense and growing interest in these technical schools that are available beyond the high school.

For instance, in my State of West Virginia, we have an outstanding small school, the West Virginia Institute of Technology. Do you know that the enrollment of that school has more than doubled in the past 3 or 4 years? There is a growing interest in that particular field and it is an excellent institution and they are just literally swamped to try to take care of the students who are trying to get in because of the courses offered in that particular field.

So what you have said, Mr. Perkins, might apply to some school that was teaching subjects other than that, but I don't think it is going to imply that there is plenty of room; that they were not overcrowded.

I do not think that applies to your technical schools at all.

Mr. PERKINS. One fact that bears on this same point was brought out by Mr. Gwinn. We had a higher enrollment in engineering schools this year than ever before, and it has been going up. We find, however, that only 50 percent of all these people who initially enroll in engineering schools go on to graduate.

Now, that mortality is very largely owing to the inability of these youngsters to do mathematics and science work, which again I think very largely relates to the preparation that they have had for those

courses in which they think they are interested. Of course, many of them do not succeed in technological education owing to a lack of real personal aptitude to the extent that they need it to succeed. But also, in part it is owing to having had too poor instruction and not having mastered the courses in mathematics and science through trigonometry.

They really ought to be in a position, if they are going to make real progress in engineering education today, to be able to do calculus in the freshman year. The engineer schools are putting more emphasis on basic science and taking up less time with the rudiments of mathematics.

Mr. BAILEY. This school that I mentioned is a clearinghouse for my appointments to West Point and Annapolis. When they talk to me about appointments, I suggest to them that they attend West Virginia Institute of Technology, and in not a single instance has that institution let down a student I have sent there. They have all been able to qualify.

Mr. JOHN A. PERKINS. This mortality in those entering engineering who do not go on to graduate bespeaks the need for this counseling, testing, and guidance that we talk about. There are a lot of youngsters who, because they read in the paper of the need for engineers, say, "I am going to be an engineer." Very likely, if properly tested, there would be indication that they were never in the world cut out to be an engineer.

Mr. BAILEY. No doubt somebody has already asked you this question, but just how are we with regard to a sufficient number of well-trained counselors to take on a program of that kind?

Mr. JOHN A. PERKINS. I think Dr. Derthick perhaps has the definite statistics on that.

In a general way, to answer your question, we do not have enough. One small part of the moneys in this bill would enable us to mount a specialized training program to bring along a more nearly sufficient number of counseling, guidance, and testing people through summer school programs to give us what we need.

Mr. BAILEY. These graduate schools that you are talking about, do they offer courses in training counselors?

Mr. JOHN A. PERKINS. Yes, they do, but like almost every profession that is complicated at all today, we have a shortage. We have a shortage in these specialized counselors and testing specialists. That is true in medicine, it is true in almost every profession. But we hope, by bringing people back to summer schools established by direct grant of the Office of Education to selected institutions, to considerably step up the professional qualifications of people who are now doing counseling or who are doing teaching and counseling part time.

Mr. BAILEY. This is just a little apart from what we are talking about.

Do you think it would be any inducement to build up your teaching force if the Federal Government allowed an extra $600 for teachers who are taking those special training courses?

Secretary FOLSOM. I might say we have a plan like that under consideration now. It is with the Treasury. It is primarily a tax matter.

Mr. BAILEY. Mr. Chairman, I imagine there are some others who will want to ask questions at this time. I will have plenty to ask as we go along developing the details of the proposal, but I do not think I shall continue at the present time.

Mr. ELLIOTT. The gentleman from New Jersey, Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Mr. Chairman, I am sure all members of the committee are deeply appreciative of the Secretary's testimony. I am also looking forward to Commissioner Derthick's testimony. I am sure also that you are not envious of our responsibility in coming up with a reasonable proposition in this field. Part of the problem, of course, is that this is complex and part of the problem is that it lies within the jurisdiction of several congressional committees.

Mr. Bailey has already mentioned one that might be concerned with some aspects of this, whether or not we should provide some kind of tax credit for teachers who want to improve themselves.

I was interested to hear that you are considering taking a formal position. I wonder if in that same examination of possible ways you have given any consideration to suggesting that tuition expenses might be made a direct tax credit on the part of those who put them up.

Secretary FOLSOM. That has been suggested, of course, by many people. There again that is primarily a tax matter. But since I was working on taxes for 2½ years when I was in the Treasury, I have some competence in that field. I would say that we have considered that from both the tax angle and from the educational angle, and we do not think it will meet the situation because it would give credit to many people who do not need it in order to have their youngsters go to college. It also would not give the help to those who need it the most, those who do not pay income taxes or who are in the very low brackets.

The result might very well be that, by getting this additional credit, the universities and colleges would simply increase their tuition to offset it, which would make it harder still for those in the low income groups, and those who do not pay income taxes, to send their youngsters to colleges.

And any plan that I have seen will cost much more than we have considered here. Of course, you can vary it, depending on how much you want it to cost. But it gets into rather expensive items because you are giving credit to everyone who goes to college, whether they need it or not, and regardless of ability. It will not accomplish the purpose we have in mind and would probably increase the enrollment in colleges.

Another thing, it would enable some parents to send their children to more expensive schools than they otherwise would. It might be a good thing to do that, but we do not think any of those considerations are in the national interest, compared to some of the plans we have here. So, on the whole, I would say that we would not favor a general aid.

Also, from the tax angle, it brings up another point. If you give special credit deductions for this type of expense, the other types of expenses might also qualify.

Speaking as an old Treasury man, one of our difficulties, the reason we have such high rates now, is that we have so many deductions

and exemptions and special credits and special deductions already. We would not want to start another chain.

Mr. FRELINGHUYSEN. Having a bill in that would provide a tax credit. I perhaps should not have asked such a question as this.

Secretary FOLSOM. I will say again that is a matter for the Treasury people to pass on, and the Ways and Means Committee, but those are just my opinions.

Mr. FRELINGHUYSEN. I have one further question in connection——

Secretary FOLSOM. I might say, on the other hand, the question Mr. Bailey raised is quite a different matter; the question of having the teachers deduct expenses for summer school on their taxes is a different matter. We are discussing that matter now with the Treasury.

Mr. FRELINGHUYSEN. I do not want to get into an argument, but the tax credit for tuition expenses would be primarily a benefit to the middle-income groups. In other words, it may be legislation of a special kind, but surely a special benefit to teachers.

Secretary FOLSOM. The teacher thing is more of a business deduction, just as you have deduction for business and professional expenses.

Mr. FRELINGHUYSEN. I would look with sympathy on both.

Mr. Secretary, the Interstate and Foreign Commerce Committee of course has jurisdiction over the responsibility of the National Science Foundation. I just have one question in connection with their proposed responsibility, the increased appropriations that would be made available to them.

I would assume that the Department of Health, Education, and Welfare would have primary jurisdiction over educational matters.

How do you envisage that the two programs would mesh together? Would you say that it is a more reasonable responsibility for the National Science Foundation to increase its program as suggested than to have an increase of activity in your Department.

Secretary FOLSOM. Of course, they are simply expanding the activity they are already engaged in. I do not think any new legislation is required for the program, for the expense of that program, which the President has recommended. They are already in it and they are doing a good job of mainly training teachers in science and mathematics.

I do not see anything to be gained right now by transferring it to us.

Mr. FRELINGHUYSEN. I have no further questions, Mr. Chairman.

Mr. BAILEY. I have one more question.

Mr. ELLIOTT. The gentleman from West Virginia.

Mr. BAILEY. There is legislation pending in my General Education Committee, introduced by one of the Members of Congress from the State of Texas, which I think is an excellent idea. I would like to have your reaction to this.

He is proposing the recognition of and the formation of a group in science similar to our Future Farmers of America. I think they have a national charter. He is proposing to set up, particularly in your industrial high schools, a group that would function similarly to our Future Farmers of America in that they would select a program like one of the farm boys would select a calfgrowing program or sheepgrowing program, that the youngsters should be encouraged to join

in this Future Scientists of America organization. Do you think there would be some merit?

It would reach these industrial high schools where you have a tremendous amount of delinquency, give those youngsters something to get their teeth into in developing a project in science.

Do you think there is any merit in the proposition?

Secretary FOLSOM. I would like to study it, but I know that the Future Farmers organization has done a very good job. It might create a little interest.

Mr. BAILEY. I want the subcommittee to give attention to that legislation if legislation is required.

Mr. JOHN A. PERKINS. Mr. Bailey, you perhaps are already aware of the science fairs that in almost every community are taking hold with the same thought in mind that this legislation has proposed.

Each high school will have a science club and then people who belong to that get up a project. Sometimes they are rather significant and sophisticated projects for young people of that age. Then once during the school year, they will bring together all their exhibits and projects and have a science fair, which is not unlike the idea mentioned.

Mr. BAILEY. That is what the Future Farmers do.

Mr. JOHN A. PERKINS. Yes. It is fairly common in some areas.

Mr. BAILEY. I believe that is all.

Mr. ELLIOTT. The gentleman from South Dakota is recognized.

Mr. MCGOVERN. Mr. Secretary, I would like to say first of all that in listening to your discussion here today, and the discussion of your associates, it has certainly deepened my own appreciation of the problems we are dealing with at this time.

There are several questions that have been in my mind, both this morning and this afternoon, as I listened to the comments from you and some of the members of the committee.

First of all, with regard to the scholarship phase of the program, we have had some questions about whether or not this went to the heart of the problem.

In addition to the 10,000 students who will benefit directly from this program, do you not envision an additional intangible benefit from this program from the stimulus that it will give to interest in education in general when the Federal Government indicates to the whole world that we think scholarship is important enough to be recognized by the Congress and by the administration?

Secretary FOLSOM. It is extremely important, probably the most important fact of the whole business.

Mr. MCGOVERN. We have had some discussions about the importance of creating desire and creating appropriate atmosphere in which education can move forward. Certainly that ought to be one advantage in any kind of scholarship program.

Now if that is true, do you see some possible danger in the Federal Government implying that we regard science and mathematics as on a higher plane of value at any time than other phases of our curriculum? I know that this question has been raised in general form here before.

Secretary FOLSOM. Of course, we think it can be more directly related to the national security right now than any other part of it; but

we also, as you know, haven't any strings attached at all as to what field the recipient of the scholarship will go into.

The only thing we are saying is that they ought to have good preparation or aptitude for math and science because we think that is good for almost all. If these people are going to be leaders in the future, we would like to have them have some science in high school.

Mr. McGovern. I am willing to recognize that you and your associates here are aware of the thing that we are talking about as far as the danger of overemphasis, and yet will not the impact of this bill on the public mind be one of indicating that the Federal Government regards science and mathematics as more important to our national interest and our national security than any other part of the academic curriculum?

Is that not going to be the general impact of the program?

Secretary Folsom. I do not know. Of course, you cannot tell. But we do realize that there is a certain imbalance right now and it is a deficiency which we are trying to correct. We do not think the deficiency necessarily exists in some other fields.

Mr. John A. Perkins. I would think that the immediate psychological effect might be along the lines you describe.

However, as this bill takes hold and the money starts to get into the school system and the scholarships are distributed, I do not think that will be the effect.

It will really redress the imbalance which has come to exist as a fact within our secondary educational system.

Inadequate as all teachers' salaries may be, by material standards, the salaries that are paid to high school music teachers and so on, art teachers, and drama teachers, are much more nearly competitive. Indeed they may be the best source that a person with those particular talents could turn to to earn a living.

Whereas certainly that has not been true of people who have the talents to teach math and science. As a result of what has existed in this respect I suppose in a measure, by reason of having gotten well qualified, exceedingly well qualified, music teachers, we might be said to overemphasize the humanities in our public education system.

I doubt that we have, but that might be a sequence thought to the fact that they are more nearly competitive in their salaries.

So that really all we will do is to try to bring math and science into a new equilibrium with the subjects that have come into being since the day when Mr. Nicholson and some of the rest of us were in school.

That is, as I see this thing upon reflection.

Secretary Folsom. There again it is a question of what the Federal Government's interest in this thing is concerned, from the national security point of view.

Also, I want to point out as far as scholarships are concerned, many of these schools now, good schools now, require this preparation in math and science which we are talking about regardless of what the youngster is going to get into later on.

Mr. McGovern. The thing that concerns me, Mr. Secretary, I think it may not be true that science and math even at this time is any more directly related to our national security than other aspects of the curriculum.

I think that is the point that Mr. Udall is trying to develop. We have had a lot of discussion in the press and elsewhere about accelerating science.

I am not so sure we need to accelerate science any more right now. I think it is some of the rest of us that need to be accelerated to deal with the things that science has created.

Secretary FOLSOM. Of course, there you get into general education which we feel is the function of the State and local governments.

Mr. J. A. PERKINS. Where we are doing a pretty good job of education, coming back to Mr. Nicholson's thought, certainly our educational system we would say was superior to Russia's. One reason that it is superior is that it is doing a good job in these other areas.

We simply want to make sure that we are doing a good job in these specialized areas that do relate so directly to a scientific age such as that in which we are living and will come to live in the future.

I really worry more about those people who are interested in general education being ignorant to the point of not being enlightened to live in their own time by reason of their lacking any background in science and math.

That is why I do not worry personally at all about requiring good preparation in math and science for these youngsters that are going to get scholarships. Even if they are going to be in music, art, and history, they need to live as enlightened people in our day. This requires a pretty good understanding of math and science.

That is part of humanism in our era.

Mr. MCGOVERN. I certainly am not indicating any feeling on my part that science and math are not important, I think that they are, but I also feel that there needs to be a general toughening of the curriculum all up and down the line and we have softened up not only in science and math, but, as Mr. Nicholson has said, in grammar, history, and some of these other important disciplines.

The Soviet Union can perhaps get away with that mistake of overemphasizing science because their people don't have to make independent political judgments, but in our society we depend on a broad level of understanding of political and economic and social problems on the part of our citizens.

I certainly hope that we will not give the impression that those things are not equally important.

Mr. J. A. PERKINS. I certainly agree with you on that.

Mr. DERTHICK. I think we cannot stress too much that English, for example, is just as important as math and science. I know in the times I have heard Dr. Killian speak; he is a vigorous advocate of a balanced curriculum. Yet I was impressed deeply, I have thought about it as much as almost any other single bit of testimony, about a year and a half ago, before perhaps this committee or the general committee, he was testifying to this effect, that in this age when mathematics is an essential ingredient we are in danger of becoming a nation of mathematical illiterates. Yet, at the same time he would agree with you vigorously that we need a balanced curriculum.

I believe the pressure in every nook and corner of the Nation is going to exert itself in maintaining that balance.

I mean just as you are concerned about it, everywhere I go people are concerned about it, and I think we can look to the people at the State and local level to see that that is done.

Yet again let me mention the imbalance now existing in a number of enrollments, a number of courses, the qualifications of teachers and so forth.

Mr. McGovern. My experience in education certainly has not been as extensive as yours, Dr. Derthick, but I did teach history for 4 or 5 years and I came away from that experience convinced that if there was any one weakness on the part of the student that I drew that stood out above everything else, it was their inability to write a theme or to write a sentence that made sense sometimes.

I think that is still a very great weakness in our educational system. In all due respects to the progress we have made in the humanities there is still a lot more effort that needs to be put in that field.

Mr. Derthick. I agree with you and there, again, we come to the matter of what is the Federal role. It seems to us that the Federal role can be more closely identified with the math and science problems at this time.

Mr. McGovern. But only on the assumption that those subjects are more pertinent as far as our national security is concerned than other subjects.

Mr. Derthick. No; on the realization that those subjects have depreciated more and that they have been given less emphasis and less attention. That is our plea.

Mr. J. A. Perkins. We can get such people as you to teach history, but we cannot get such people as you to teach mathematics.

Mr. McGovern. There is one other question. You referred to, Mr. Secretary, the importance of the President's Committee on Education Beyond the High School and indicated that some of the results of that study provoked your statement here today.

Now, as I remember the President's Committee, that is their report, they indicated that sometime in the next 5 to 10 years we ought to double college teachers in order to retain qualified teachers and attract other teachers who are qualified to the profession.

Does your program envision any assistance in that area?

Secretary Folsom. Our program provides for grants to graduate schools, to help them turn out more college teachers and also fellowships for those attending the graduate schools, but we do not have any provision for direct grants to the institutions for increasing salaries.

Of course, the one-hundred-and-sixty-odd graduate schools that we give these grants to, can use that money to increase the salaries of their teachers or hire more teachers or purchase equipment. So those particular teachers would be benefited but they are the teachers in the graduate schools.

But we have no provision for college teachers in general.

Mr. McGovern. Am I interpreting that report correctly, the Committee on Education Beyond the High School, that they implied, either directly or indirectly, that doing something about this problem of teaching salaries is the No. 1 priority in education today?

Secretary Folsom. I think it is a very high priority, but I don't think they suggested that the Federal Government should do anything directly.

Mr. J. A. Perkins. They indicated the No. 1 priority is the one that we are trying to effect by this legislation. That is to take advantage of the lead time that exists between now and the oncoming

tidal wave of students as it has been called, to train teachers so that we will be able to more nearly staff our colleges and universities.

We have effected the supply problem by these proposals. We have not effected the salary problem.

Mr. RICHARDSON. Mr. McGovern, one of the people with whom we discussed the problems of education and the development of these proposals, was President Herman B. Wells, of Indiana University, who is chairman of the Educational Policies Commission now, composed of various representatives of various educational organizations, and who has written a number of papers on the importance of increasing college teachers' salaries.

He, too, would say that this is the No. 1 priority. But he was unable to help us devise a way in which the Federal Government could directly contribute to doing it.

We have not to date thought of a good way of contributing directly to that, bearing in mind all the limitations on what is an appropriate role for the Federal Government as compared with the roles appropriate to all the other agencies that have the responsibility for education.

Mr. DERTHICK. There is this point also, that unless we begin immediately to increase very substantially the pool of people who are trained, it is not going to make much difference whether their salaries are raised, or not, and it takes time, as you well know, to train those people to enlarge the pool.

Mr. MCGOVERN. Except that raising salaries will draw people into the pool probably quicker than anything else.

Mr. DERTHICK. That is certainly true.

Yet our total program, I believe, will increase the pool by 5,500 and we have every reason to believe that there will be people to take advantage of these fellowships.

Mr. MCGOVERN. That is all, Mr. Chairman.

Mr. ELLIOTT. The gentleman from Massachusetts, Mr. Nicholson.

Mr. NICHOLSON. I could ask a lot of questions, but I do not think I will because it is a difficult proposition for your Department to come up here and get $50 million here and $500 somewhere else.

We pass a bill with all the intentions in the world of having it carried out. For instance, like pollution in streams. We appropriated a couple of years ago $50 million for 10 years. Most of the money that was allocated was allocated to places that did not have a stream within 40 miles of them.

So that is what bothers some of us. You appropriate some money to something and something else is carried on.

Of course, I do not believe that the Federal Government has any right to step into Massachusetts or West Virginia—they have a county system in West Virginia where the county builds schools, I suppose the county does it—but the county does not do anything in my State.

The school system is run by each individual town, small or large, and the cities.

The State has nothing to do with the schools and for years they never did anything for the towns and cities except appropriate $5 million, which was taken from the income tax, the State income tax, and distributed to towns that would pay the teachers over a thousand dollars a year.

Now, they have a system of aiding the towns in building schoolhouses, but that is something comparatively new. I cannot see how we can put through this policy of paying for scholarships when lots of people, individuals, and foundations, are putting money out for children to take advantage of.

Now, we went to South Dakota and Utah and Wisconsin and Oregon, and everybody, the boys and girls who would be the recipients under this were of the opinion that they should borrow the money.

The only question was: They would like to have some time after they got through college to pay it off and not pay it off in a year or two. That seems to be the consensus of opinion of presidents of colleges and superintendents of schools and even the boys and girls themselves, that they thought it would be all right, only we should set up a fund that they could get loans from.

The University of Minnesota, a man who had charge of it there, said they had a revolving fund and they gave out about $300,000 a year and had not lost half of 1 percent on the loans.

The only ones that did not pay usually were girls. They probably got married and could not get hold of any more money after they got married. It is a little different from my family, but the usual run.

As I said before, the proposition is an excellent proposition, but I think it is up to the Health, Education, and Welfare Department to educate the people throughout the country on the advantage of a college education and show them now they can do it, but you cannot do it without money because I do not know how many thousands of boys and girls graduate and do not go to college.

I have not seen many figures, but it cannot be over 5 percent that go to college. So you are picking out 5 percent and telling the other 95 percent if you were smart you would be going, or words to that effect. You are discriminating against all the rest of the boys and girls.

Do you not think you are discriminating?

Secretary FOLSOM. We are giving everybody a chance here.

Mr. NICHOLSON. Well, it is the top 25 they are talking about. I know students that barely got through high school—maybe because they were having a good time and did not take their studies seriously, they would rather play football or baseball—who went to college and were honor students.

But he would not have a chance because his record would show C or D or whatever way they mark them now. He would not have a chance under your system; would he?

Secretary FOLSOM. If he showed aptitude he would.

Mr. NICHOLSON. Of course, you get his aptitude report card; do you not?

Mr. JOHN A. PERKINS. There are really 2 ways to judge a youngster's ability to do college work; at least 2.

One is on the basis of his high-school grades, which indicate what he has achieved in the way of knowledge, in the field of Latin, English, history, math, or whatever. Or you can test him and see what not only his achievement is, but what his native ability or aptitude for college work is, which would be the type of youngster that you have just described.

He had ability, but he did not make use of it in high school. He would be eligible for consideration for a scholarship.

Mr. NICHOLSON. Of course, I do not understand it, myself. I have a daughter that went to high school and I never saw her bring a book home and her report card her mother signed. About the best she ever did was C. Then she went to war and came out; she went to finishing school for a year once. That was a Coca-Cola-drinking exhibition, I guess, and then she went to college. They asked me my advice, both my wife and daughter. I said go ahead and throw another year away if you want to.

Well, she almost made the dean's list. She was only a couple of percents off the dean's list. Now she has gone to Smith and has had another degree.

Of course, I ought to feel proud of her and I will if she does not try to be a doctor and I told her so, but there is an instance of a girl that did not have anything to praise her on her report cards, anyway.

Mr. JOHN A. PERKINS. Of course, you would not have been disappointed if some incentive had been existing while she was in high school that would have induced her to have been a better student which she would undoubtedly have been capable of being at that time; would you not?

Mr. NICHOLSON. I do not know. I will not take any chance on that answer.

Secretary FOLSOM. We think the incentive factor that Mr. McGovern mentioned is a very important thing—to stimulate the youngsters in school to do a better job and take it more seriously.

Mr. NICHOLSON. As I said before, I come from a small town and there are a lot of boys that went to college from my town and there were not any of them that were rich. Most of them were just as poor as they could be. They worked all summer from daylight until dark and worked at college and everything. They got an education.

Here we are offering to pay them money to go. As you just mentioned a little while ago, we are living in a different age, not A, B, C's, and multiplication tables, it is a little different.

Mr. DERTHICK. Yes, sir, these young people to whom you refer today might earn even more money and would, undoubtedly, than when you were in school, yet the school expenses have gone up so much they cannot make it by working.

Mr. NICHOLSON. But they do make it.

Mr. DERTHICK. But the whole point is that we are losing too many of those brains. We are trying to patch up the loopholes.

Mr. ELLIOTT. The gentleman from South Dakota, Mr. McGovern.

Mr. MCGOVERN. Mr. Folsom, earlier this afternoon Mr. Goodwin quoted from an article in the U. S. News & World Report. In that same issue there appeared an interview with Dr. Arthur Bestor of the University of Illinois who has been talking about the problems of our schools for a long time.

I would like to read a couple of paragraphs near the end of his article and get your reaction and the reaction of your associates on what he suggests.

Mr. ELLIOTT. Before the gentleman reads would the gentleman give his citation?

Mr. McGovern. The U. S. News & World Report for January 24, 1958. The article is written by Dr. Arthur Bestor of the University of Illinois. This is what he has to say in the concluding parts of the article:

> We neglected all the basic subjects because our educational policymakers did not think them important. They wanted the schools to deal only with so-called practical things, things in front of their noses, cooking, automobile driving, better boy or girl relationships, life adjustment, and the like.
>
> Now, many of them are ready to concede that sputnik has made science and mathematics practical and they are ready to plunge forth these two subjects. They have not really repudiated their anti-intellectual attitude toward education. They have simply taken up another fad.
>
> If education of this stamp controls the new program that the present crisis may bring forth, then we won't need food teaching even of science and mathematics. They will be taught as a series of specialized tricks, not as a fundamental way of thinking, and there will be a hacking away at humanistic disciplines, like history, English, literature, and foreign languages because the educators will still brand them impractical.

Then there was this question asked of Dr. Bestor: "How can this be prevented?"

He said:

> I think we need at once a national advisory commission on public educational policies composed of absolutely top-level physicists, chemists, mathematicians, historians, foreign-language specialists, professors of English literature, economists, and representatives of other disciplines fundamental to a sound school program. In view of the present emergency, I think Congress should take steps to create such a commission by statute and should do so prior to proceeding with any of the other educational proposals before us.

Do you have any comment on that?

Secretary Folsom. If we had set up such a commission and started to work there would be some little time before we would get a report from them and agreement on it and it would be some time after that before we would get legislation.

As a matter of fact, as I pointed out, we have had several exhaustive studies made of this whole question. You take the White House Conference in the fall of 1955, the results of that were based on conferences held throughout every State in the Union and many local communities. Several thousand communities had committees studying the local problems, and they appointed State committees, and the State committees sent people down here, and we had a week's discussion. This White House Conference culminated in 1955 and made certain recommendations. Then the President appointed his Committee on Education Beyond the High School, which is a very representative group, including educators and laymen. And I might say the White House Conference was 50–50 between laymen and educators.

So we have had many studies like this already made. I think the groups that we have talked to, and we have covered a pretty good cross section, agree something along the lines we have indicated is desirable and necessary at this particular time.

So I would not think it would be necessary to hold up legislation for any other commission to go into it.

Now, getting back to the first part of the question there, I do not think—maybe Dr. Derthick is better qualified to talk on that than I am—I do not think our school system is quite as bad as he indicates there. I think in other parts of that interview you will find he is in

fairly good agreement with some of the proposals which we advocate here.

I think some parts he is critical of and other parts not.

Now, we have talked to quite a few educators, by no means just scientists or mathematicians or engineers. In fact, most of them we talked to were not in that category. I would not say that you would put math and science by any means in the same category he put some of these other subjects.

I think he is just trying to make a point there. As I said before, I think we have gotten into an unbalanced situation here, and all we are trying to do is to restore that balance. Also, to bring up the point that you brought up so well, we want to be sure that we change the pattern somewhat and let the youngster know that schooling is hard work and that he ought to get down to apply himself and not take the easy courses, but take some of the courses that would be good discipline for the mind and also qualify him to go on to college to the extent of his capacity.

Mr. BAILEY. You do not really think we need any more advice from the chamber of commerce; do you?

Mr. MCGOVERN. I do not think that is what Mr. Bestor was suggesting.

Mr. DERTHICK. I might add, Mr. McGovern, 2 or 3 things.

First of all, I think the best schools in this country are unsurpassed anywhere in the world. There is a broad, well-balanced program, and thorough scholarship.

Mr. MCGOVERN. I would agree with that.

Mr. DERTHICK. I am very proud of them. I think however, all this concern we have is going to stimulate the spread of these best practices.

As the Secretary has said, we must have had at least 150 advisers, of top people in the United States and relatively few of them were math and science people.

Not only that, but the Office of Education is calling in advisers constantly in these various fields.

It was not 2 weeks ago that we had from about 28 States leaders in music and art, and we had a very thrilling experience with them in taking stock of where we are and the things we need to do to strengthen and improve music programs.

We have people in all of the fields, in the course of a year, and in the course of 2 years, cover a tremendous amount of ground in releasing broad guidance bulletins to stimulate and spread the best practices everywhere.

As I commented to the Secretary and some of my colleagues in the Department, and in the Office of Education, the music people, leaders from around the United States who were participating for a whole week in this conference were warm and enthusiastic in their praise of the Office of Education and the leadership it was affording. I said one of the reasons for their enthusiasm is that they are so pleased that we are not forgetting these other important subjects, that we are not just concentrating our attention on mathematics and science.

So we do have these advisers, as Dr. Bestor has said, already.

In the course of the year we can count up a vast number of people from broadly representative fields who come in to help us take stock and plan programs for improvement in every field.

Mr. McGovern. That is good to hear.

Mr. Nicholson. Did I understand you to say that we had the best educational system of any country in the world?

Mr. Derthick. I believe that, but what I said was not just that a moment ago. What I said was that our best schools are unsurpassed in any country in the world and that our need is to spread the practices of those best schools to more schools.

Mr. Nicholson. I think that would be excellent propaganda for you to put out.

Mr. Derthick. I have said it repeatedly.

Mr. Nicholson. That is not the story that we get from the commentators and magazines. It is that we are sadly lacking in everything, education as well as sputniks or whatever you call them.

Mr. Derthick. We have many great needs in education and we are trying to strengthen some of them, but I certainly contend and urge my conviction that our best schools are unsurpassed.

I would just like to see more of those schools in our country.

Mr. Elliott. Are there any other questions?

Mr. Richardson. Mr. Chairman, I would like to make one comment for the record, which may shed a little light on the relationship between this program and the National Science Foundation program and I think it has some bearing on Mr. McGovern's question also.

The National Science Foundation has engaged for sometime in programs designed to improve the subject matter knowledge of teachers of science.

This is essentially the purpose of the institutes which they support for the in-service training of teachers.

They have also, in cooperation with the Fund for the Advancement of Education and the Sloan Foundation, provided funds for the Massachusetts Institute of Technology, for the development of an improved curriculum in physics.

This is associated also with the development of a large number of films to be used in the schools.

This work will go forward in other fields of science. In the course of time part of the expanded appropriation that the Foundation is seeking for fiscal 1959 will be devoted to that kind of program.

We felt that it was appropriate that this should be done that way, that our role lay rather in the direction of helping State departments of education to exercise leadership in getting local school systems to make use of the materials that are being developed.

We have not felt that it was appropirate for an agency like our own, like the Office of Education, which would be administering funds to assist State departments of education and local school systems to improve their programs, at the same time develop curricula material as to which we said, "Here, use this." Rather what we are doing is to make funds available for them to improve their personnel and to provide for in-service training of them.

Meanwhile the National Science Foundation is engaged in programs to develop or provide funds in cooperation with others for the development of curricular material and incidentally also programs of the kind touched on earlier by Mr. Bailey in connection with future scientists of America.

One of their programs would be concerned with all sorts of devices to make scientific careers attractive. They would provide for lead-

ing scientists to visit schools in various parts of the country, traveling exhibits and all that kind of thing, and for exchanges of faculties between large university centers and smaller institutions in the neighborhood.

In general, therefore, the division of functions between this program and the expanded activities of the National Science Foundation follows essentially these lines.

Wherever the program in question involved fields other than science, or where it involved direct relation with state departments of education and local school systems, the function was allocated to us.

Where relations with institutions of higher education in the support of basic research for graduate fellowships and postgraduate fellowships in science were involved, the National Science Foundation would administer the program.

Mr. FRELINGHUYSEN. It seems to me that part of this program is going to be handled through HEW, that deals with graduate programs, fellowships.

Mr. RICHARDSON. Our program is directed to the expansion of graduate schools as the source of college teachers generally. It is not limited to graduate school programs in science, engineering or mathematics. It would, therefore, be foreign to the purpose of the National Science Foundation to undertake that program.

Further, their fellowships are awarded to individuals on a competitive basis. Our concern is with the expansion of the capacity of the schools.

Secretary FOLSOM. They also are more interested in research being done by the recipients.

Mr. FRELINGHUYSEN. In both cases there will be institutes to improve the quality of those who are or will be teachers; is that not right?

Mr. RICHARDSON. We have no institutes for science teachers. The only overlap in any sense is in the graduate fields and there I have indicated how the distinction is drawn. We have institutes for language teachers and for counseling and guidance personnel, but there seemed no reason in the case of temporary programs designed to meet an emergency need to shift from the National Science Foundation the programs they already have for the in-service training of secondary school teachers.

So that is not part of this program.

Mr. BAILEY. I am sure a great many members of Congress are wondering why some of that legislation is being handled by the Interstate and Foreign Commerce Committee and some of it is being handled by the Education Committee.

Evidently, the overriding thought in the establishment of your Academy of Science was materialistic thinking, of the advancement of industry and training of specialists of that kind, not too much thought given to the humanistic side of the problem.

Mr. RICHARDSON. The foundation was, of course, set up to exercise leadership in the field of science. That was its purpose.

Mr. BAILEY. I never understood why it was referred to the Interstate and Foreign Commerce Committee to begin with. That legislation came out of that committee and any legislation bearing on it will go back to that committee now.

Mr. RICHARDSON. Basically the National Science Foundation can carry on, under existing authority, all the programs for the improvement of science teaching and for training of science teachers which fall within the general area I have described.

So their program really, in relationship to this program, would require substantially increased appropriations, but not new legislation.

Mr. BAILEY. They appear to have more success in getting appropriations than we have for some of our school programs.

Mr. ELLIOTT. We have had a rather good day of it here.

I am sure that the members of the committee have indicated by their questions their interest in this subject matter.

I want to express my appreciation to you, Mr. Folsom, to you, Mr. Perkins, to you Mr. Richardson, and to you, Mr. Derthick, for your kindness in bringing your testimony today.

Before I announce the further program I recognize the gentleman from West Virginia who desires to make an announcement.

Mr. BAILEY. Mr. Chairman, since your committee is not functioning tomorrow, I have called a session of the General Education Subcommittee. We would like to hear from the Bureau of Indian Affairs on matters concerning Public Laws 815 and 874.

We would like also to give the Department of Education an opportunity to refute, if they care to do so, or are able to do so, the testimony that has been given in this matter during the past week.

So the Subcommittee on General Education will convene in the committee room here at 10 o'clock tomorrow.

We would like to have a representative from the Department here.

Secretary FOLSOM. We will have someone here, Mr. Chairman.

Mr. BAILEY. It will be an open meeting and we will discuss the proposals.

Mr. ELLIOTT. And our committee will resume its sitting at 10 o'clock on Wednesday, and our first witness if the timing is agreeable with you, will be the Commissioner of Education, Mr. Derthick.

Mr. DERTHICK. All right, sir.

Secretary FOLSOM. We thank you very much for your kind attention.

Mr. ELLIOTT. The committee will stand in recess until 10 o'clock Wednesday.

(Thereupon, at 4:45 o'clock p. m., the subcommittee was recessed, to reconvene at 10 a. m., Wednesday, February 5, 1958).

Mr. Richardson. Similarly the National Science Foundation can carry on, under existing authority, all the programs for the improvement of science teaching and for training of science teachers which fall within the general area I have described.

So their programs, mostly in relationship to this program, would require substantially increased appropriations, but not new legislation.

Mr. Haskins. They appear to have some success in getting appropriations through for some of our school programs.

Mr. Richardson. We have had a rather good deal of it.

(I am sure that the members of the committee have satisfied by their questions their interest in this subject matter.)

I want to express my appreciation to you, Mr. Folsom, to you, Mr. Perkins, to you, Mr. Richardson, and to you, Mr. Derthick, for your kindness in presenting your testimony today.

Before I terminate the present program I recognize the gentleman from West Virginia who desires to make an announcement.

Mr. Bailey. Mr. Chairman, since your committee is not functioning tomorrow, I am calling a session of the General Education Subcommittee. We would like to hear from the [illegible] concerning Public Laws 874 and 815.

We would like also to give the representatives of [illegible] an opportunity to review, if they care to do so, or are able to do so, the testimony that has been given in this matter during the past week.

So the Subcommittee on General Education will convene in the committee room here at 10 o'clock tomorrow.

We would like to have a representative from the Department here, Secretary Folsom. We will have someone here, Mr. Chairman.

Mr. Bailey. It will be an open meeting and we will discuss these proposals.

Mr. Elliott. And our committee will resume its hearings at 10 o'clock on Wednesday, and our first witness, if the timing is agreeable with you, will be the Commissioner of Education, Mr. Derthick.

Mr. Derthick. All right, sir.

Mr. Elliott. Thank you very much for your fine testimony.

Mr. Elliott. The committee will stand in recess until 10 o'clock Wednesday.

(Thereupon, at 12:15 o'clock p.m., the subcommittee was recessed, to reconvene at 10 a.m., Wednesday, February 5, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

WEDNESDAY, FEBRUARY 5, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION
OF THE COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittee met, pursuant to notice, at 10:15 a. m. in room 429, Old House Office Building, Hon. Carl Elliott presiding.

Present: Representatives Elliott (chairman of the subcommittee), Green, McGovern, and Nicholson.

Also present: Representatives Perkins, Wier, Landrum, Roosevelt, Gwinn, Frelinghuysen, and Dixon.

Staff members present: Fred G. Hussey, chief clerk; John O. Graham, minority clerk; Charles M. Ryan, general counsel, Kennedy W. Ward, assistant general counsel; Russell C. Derrickson, chief investigator; Mary P. Allen, subcommittee clerk; and Robert E. McCord, clerk, Subcommittee on General Education.

Mr. ELLIOTT. Our first witness today is Dr. Lawrence G. Derthick, United States Commissioner of Education, who is accompanied by Dr. John Perkins, Under Secretary of Health, Education, and Welfare, Mr. Elliot Richardson, Assistant Secretary of Health, Education, and Welfare, and by Ralph C. M. Flynt, John R. Ludington, Herbert S. Conrad, Melvin W. Sneed, and Lloyd E. Blauch, of the United States Office of Education.

We have a statement from Commissioner Derthick and I understand that he would like to read this statement first, before questions, and if that understanding is correct, you may proceed, Mr. Commissioner.

We are happy to have you.

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STATEMENT OF LAWRENCE G. DERTHICK, UNITED STATES COMMISSIONER OF EDUCATION, ACCOMPANIED BY JOHN A. PERKINS, UNDER SECRETARY; ELLIOT L. RICHARDSON, ASSISTANT SECRETARY FOR LEGISLATION; MELVIN W. SNEED, DIRECTOR, LAWS AND LEGISLATION BRANCH; LLOYD E. BLAUCH, ASSISTANT COMMISSIONER AND DIRECTOR, DIVISION OF HIGHER EDUCATION; RALPH C. M. FLYNT, DIRECTOR, HIGHER EDUCATION PROGRAMS BRANCH, DIVISION OF HIGHER EDUCATION; JOHN R. LUDINGTON, CHIEF, SECONDARY SCHOOLS, INSTRUCTION, ORGANIZATION AND SERVICES BRANCH, DIVISION OF STATE AND LOCAL SCHOOL SYSTEMS; FRANK L. SIEVERS, CHIEF, GUIDANCE SERVICES, INSTRUCTION, ORGANIZATION, AND SERVICES BRANCH, DIVISION OF STATE AND LOCAL SCHOOLS SYSTEM; AND HERBERT S. CONRAD, DIRECTOR, RESEARCH AND STATISTICAL SERVICES BRANCH, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Mr. DERTHICK. Thank you, Mr. Chairman, and members of the subcommittee.

I will proceed to read this statement. However, if you did wish to interrupt sometime, it would not disturb me. It might move forward better to at least go through each title before we pause for questions.

I think in this testimony we have some material that is new and will reflect other illustrations and points of emphasis than we brought out last Monday.

I appreciate your inviting my colleagues and members of the staff, from the office. I think they will be very helpful to us.

Of course, it is good to have Under Secretary Perkins and Assistant Secretary Richardson here.

I should like to say in the beginning, Mr. Chairman, that in my considered judgment the best American schools are unexcelled. What is needed is to bring about wider application of the practices of our best schools and school systems. Essential features of the proposed legislation are designed to provide stimulus toward this end. Our aim is to stimulate and encourage concerted action on the part of the several States, thousands of local school districts, and the many private institutions—action in the interests of national security, which otherwise might be delayed by some of them, or not undertaken at all by others.

Secretary Folsom has outlined the legislative recommendations and their background. With your permission, we shall explain them, largely in terms of the problems to which the proposals are addressed, and with a view to assisting the committee in developing supporting information for the record. To this end, Mr. Chairman, and as your deliberations continue, the resources of the Office of Education are at your disposal. We would be privileged to supply such additional information and to render such technical assistance as the committee may require.

Turning now to the proposals, we shall take them up in the order in which they appear in the bill (H. R. 10278). First, I should say that the programs authorized by the bill would be for a period of 4 years beginning July 1, 1958, except that scholarships awarded under

title I and graduate fellowships awarded pursuant to title IV during the 4-year period would continue beyond that period to permit completion of the undergraduate or graduate training.

The programs authorized by the bill would be applicable to the 48 States, the District of Columbia, Hawaii, Puerto Rico, Guam, and the Virgin Islands.

The proposed legislation, if enacted, would be administered within the Federal Government by the Commissioner of Education under the general supervision of the Secretary of Health, Education, and Welfare.

Title I of the bill would provide assistance to encourage the States to develop and expand programs for the early discovery of student aptitudes, and for the maximum development of these aptitudes, through improved counseling and guidance services in the high schools. It would also provide an incentive to able students in need of financial assistance therefor to go on to college, through provision of a limited number of undergraduate scholarships.

It is clear, I believe, that the identification of able students who can profit from further education is an essential first step in developing the Nation's manpower resources. Early identification of the abilities of all students provides the high school counselor and the students with information essential to them in planning their high-school programs and developing educational objectives. Test results and other personnel records enable counselors and teachers to advise and encourage students and their parents to make long-range educational plans. Regrettably, this is not being done, or certainly not being done as effectively as it should be, for large numbers of students today.

For illustration, in a study recently completed by the Office, entitled "Retention and Withdrawal of College Students," it was found that 32.4 percent of the 1,200,000 graduates of public and private secondary schools in 1950 entered college in the fall of 1950 as full-time students; and that an additional 11 percent continued their education on a part-time basis. One-half of the high-school graduates who stood in the upper half of their classes did not go on to college on a full-time basis, and 1 in 5 never enrolled in college.

Currently, with the assistance of a grant under the cooperative research program provided for by Public Law 531, 83d Congress, the University of Wisconsin is engaged in a study of the plans of high-school graduates of that State. A progress report of this study was made by Dr. J. Kenneth Little, director of institutional studies of that university, to your subcommittee, Mr. Chairman, when you held hearings in Eau Claire, Wis., October 28, 1957. Based upon the questionnaire returns of 34,000 public high-school graduates and defining the superior group as the top one-fourth based on school grades, Dr. Little found that 27 percent of the boys and 35 percent of the girls indicated that they had no plans to continue their education.

We are concerned that this sort of thing is occurring all over the country. Lack of understanding of potentialities, lack of motivation to continue education beyond high school, and financial reasons account for the loss of most of the superior students who drop out of school before completing their education. In the interest of national security, it seems to me that we are compelled to take steps to reduce this waste of talent—lost or undeveloped talent, which we sorely

need in order to meet the critical demands for scientists, engineers, teachers, technicians, and all other occupations where shortages exist.

Moreover, our concern is deepened by the fact that the needs of our expanding population in the years to come, estimated by some to reach a maximum of 228 million by 1970, must be fulfilled from a very restricted pool of young manpower. We have heretofore called your attention to that startling fact of the small number of 18-year-olds, smaller than it was in 1940 and since then we have gained 30 million in population, and what that means 20 years from now I shall not repeat further, but it is a very serious situation and it means that we need to save every one of these youngsters we can because we are going to have a shortage of leadership when our population grows so great.

Our democratic system of education stresses the essentiality of the greatest possible degree of free choice of programs of study on the part of individual students. The validity of this education process depends upon the availability of adequate basic information for the use of teachers, counselors, other school personnel, and of parents and students. It also requires the services of qualified counseling personnel to aid in this process.

Tests designed to measure abilities and special aptitudes, when used in conjunction with student records and other information, are the most reliable method available for early identification. Many of our high schools and a few States do some guidance testing, but much of it is incomplete and not adequately followed up with individual counseling to make full use of the test results. Also, many schools have inadequate student record systems.

Test results and other cumulative student data can result in good educational planning by students and their families, only if the facts are properly interpreted and utilized by the students and their parents. Yet it is estimated that not more than one-half of the high school students in the Nation are provided with the services of a well-rounded counseling program. Contributing to this situation is a severe shortage of qualified guidance personnel.

As might be expected, there is wide variation from school to school and from State to State in the distribution of counseling personnel employed, in the extent of counselor preparation, and in the number of students which each counselor must serve. Altogether the Nation's schools now employ approximately 26,000 counselors, including both full-time and part-time personnel. In terms of full-time equivalents, there are approximately 11,000. The best current estimates put the need at 15,000 additional counselors in the public high schools alone, if these services are to be provided adequately. Yet, in 1956, only about 2,500 graduate degrees were granted by institutions of higher education to serve all levels of education in guidance and personnel work. Also, it is known that not all of these entered education and that there is considerable turnover among counselors in secondary schools.

I think we know that industry, among one of these agencies, is draining off the counselors, having realized their great aid and advantage.

The present yearly supply of adequately prepared counselors is little more than enough to meet current replacement needs.

A total of 41 States employ some personnel charged with counseling and guidance responsibilities. However, the State departments at this time generally are not staffed sufficiently to provide the professional leadership, consultative services, research, and publications which are required to promote the necessary expansion and improvement of guidance services in the local schools. The 41 State programs employ a total of only 63 persons, counting both full-time and part-time personnel, who are responsible for giving professional leadership for these services. A recent survey of the State departments indicated that the difficulty in providing adequate guidance services, at both the State and local levels, is attributed to inadequate staff, both in numbers and preparation, and inadequate financial support for these services.

A majority of the States have adopted certification standards for counselors and guidance personnel. At present 36 States, 3 Territories, and the District of Columbia have programs of counselor certification, 33 of which are mandatory and 7 optional. In a majority of the States these standards are minimum. Yet many persons providing counseling services do not meet the minimums for certification.

The comment is often made that every teacher knows the good students in the class. And this is a comment that is all too often misleading. Thus the need for standardized and comprehensive testing and counseling is dismissed. It is not that simple: Getting high grades in a given course is not a reliable indicator of ability. Conscientious Mary may appear to be brighter than she is, owing to her diligence. But lazy John, with unusual intellectual ability, may mistakenly be thought to be less than average because he has never been motivated to work to his capacity. To identify effectively the talents of these young people and thousands like them, scientific testing procedure must be used. Only after such reliable identification do the counselors and teachers have the tools necessary for proper guidance and counseling.

Just what is counseling and guidance all about? It is hard to describe in a few words, because it is a complex process and involves the entire counseling team—guidance and visiting teacher personnel, e. g., and school psychologist, as well as the classroom teacher and the administrator. Such counseling should dissuade lazy John from enrolling in courses that do not prepare him for continuing high intellectual effort in areas of his greatest aptitude. Instead, he would be encouraged to enroll in courses which are more appropriate to his ability—for example, trigonometry and physics. Thus he will be prepared for the college which he ought to attend. The demands that John will be required to meet continuously under a sound program of counseling and guidance will develop those habits of hard and careful work, which are basic to success in all human endeavors. What is true for lazy John and conscientious Mary applies in varying degrees to all of our boys and girls with their multiplicity of problems and needs.

Our legislative recommendations are designed to stimulate the development of a program of State and local action, which will provide the essential professional and administrative leadership in the State departments of education, adequate State supervisory services, and expansion and improvement of testing, counseling and guidance pro-

grams in local schools. We would expect not only to expand and improve the professional aspects of testing, counseling, and guidance, but we would in addition encourage such services to penetrate the home and the community to a much greater extent than prevails today. We must identify talented youth early and utilize the school, the home, and the community to the maximum extent possible in motivating our children to acquire optimum education and training.

The administration of this program in the States would be carried on by the State educational agencies under plans to be approved by the Commissioner. A State plan for testing and for counseling and guidance of high-school students would be approved by the Commissioner if it met those conditions specified in the bill. One such provision would require administration of the plan by the State educational agency. Under further provisions, a State must include in its plan arrangements for the testing of students, for the maintenance of testing and other student personnel records, and for strengthening counseling and guidance services; and these are to be set forth in the State plan, along with the methods of conducting the testing, maintaining records, and strengthening counseling and guidance activities.

In addition, the bill would provide for grants by the Office of Education to institutions of higher education, for operation of short-term and regular training institutes to improve the qualifications for counseling and guidance work of personnel in the public or other nonprofit secondary schools engaged in such work.

While no specific sum is authorized to be appropriated for the testing and counseling and guidance programs, the order of magnitude of program costs which we believe to be necessary are estimated at $16,275,000 in the first year, increasing to $24,800,000 in the fourth year.

Mr. ELLIOTT. Mr. Commissioner.

Mr. DERTHICK. Yes, sir.

Mr. ELLIOTT. I wonder if it might be possible to get you now to summarize for the record what you have just said with special emphasis upon how your bill would operate in this field? I realize you have gone into it in considerable detail here, but I would like to have a summary in the record at this point.

Mr. DERTHICK. Very good, and I think at this point I will make use of one of my aides, who is specialized in this. I think I will call on Dr. Ludington to summarize.

Mr. LUDINGTON. Well, I think the plan would be to invite the States to suggest ways of supplementing their State staffs in order to provide leadership to local schools in providing better guidance programs for teachers and for students.

This plan also includes a provision for the upgrading of persons with interests in the guidance field so that we might have a higher level of professional competence on the part of persons working in this area.

The testing program is a very essential aspect of guidance and counseling in that we need some standardized measures of interest, aptitude, and ability.

The plan also provides for a better record system, that is, a record containing factual information from the tests, from the judgments of teachers about youngsters, so that at times when choices are made

we at least have some measures to guide decisions of youngsters and teachers.

All of this I think is also designed to insure a measure of validity for the identification of youngsters with ability and need who would receive the scholarships that are provided also in this title of the bill.

This section, as we see it, is noncategorical. We are concerned with a better identification and development of students across the board and we are hopeful that this will not only provide the incentive for youngsters who are not now going to college to do so, but for those who are not of college ability or inclination to make maximum use of their talents in other areas of our society.

Mr. ELLIOTT. Dr. Ludington, does the ordinary rural school in America have any counseling and guidance services whatsoever today?

Mr. LUDINGTON. Those services tend to be limited. There are some parts of the country these services are provided on a county basis, and a person is available for limited periods of time in individual schools not on a continuing basis.

Mr. ELLIOTT. My home county has seven high schools. Do you mean to say that in areas where an attempt is made at counseling and guidance that we have a counselor who goes to seven high schools and attempts to see these graduates, or how does it work?

Mr. LUDINGTON. No. I would say in most cases in those small schools the principal or the teachers would provide this service to the best of their ability.

Where we are concerned with a higher level of professional competence, then we might provide it by having a person serving several schools in the county.

Mr. ELLIOTT. If he serves several schools, who would he serve, the teachers? Would he talk to the teachers or would he talk to the individual students?

Mr. LUDINGTON. No. We would say in that case that his professional contribution would be in advising principals and teachers. There may be individual instances where the problem is beyond the competence of the principal or the teacher and we might ask this especially trained person to deal directly with individual students. But I would think those would be unusual cases.

Mr. ELLIOTT. One of the ideas is that if the testing service can spot these bright and capable youngsters who have in addition to their brilliance the necessary motivation that through a program of counseling and guidance they may be led to pursue higher education.

Now, let us talk a little bit about this testing business. I have always had, since college days, lots of doubts about these tests. I think they are as good as perhaps can be devised up to this point. But is there not lots of doubt about their validity?

Mr. LUDINGTON. My answer to this would be as follows, and I think Dr. Conrad should get into this because it is a field in which he has had considerable experience: There are, to be sure, instances when individual measures on a single test might not be reliable. There may be a matter of motivation or environmental distraction that would distort a single test score. In general I think there is considerable reliability to be attached to good tests as group measures. The advantage, I think, is in having a series of tests or a battery of tests rather than reliance upon a single test.

Many of our good school systems are now utilizing tests of mental maturity and mental development at different stages in the student's progress in school. They are also maintaining tests of his achievement in areas such as reading, mathematics, and so on.

Those, I think, have a rather high degree of validity and reliability. They have been improved as time goes on. I think they will be even more improved as more school systems use them and these data are analyzed and combined in further refinement.

Mr. DERTHICK. May I interrupt just a moment, Mr. Chairman, because I think we are hitting paydirt now. While we place great emphasis on the testing program which Dr. Ludington reviewed and analyzed, we realize that testing also would be inadequate without a number of other measures of the child's ability and potentials. The teacher judgment, for example, we could not do without at all; the record of school grades, various reports on the development of the child, anecdotal records—all these would go into this cumulative file.

So that having begun at an early stage to identify this child as being of exceptional ability there would accumulate a great deal of evidence, a mass of evidence, in addition to the tests, all of which would be extremely helpful in the guidance process.

I was interested in your illustration of your own home county because I have taught school in such a county and I am very familiar with such conditions.

A county system like that typically in this country is the most shortchanged system on these guidance programs. I do not think we could, as a practical matter, expect to have a specialized trained guidance counselor in every one of those schools. A practical way would be to provide the county with one especially trained person, who would work with the teachers. We can never get away from the teacher as the key to this guidance process. But the teacher finds a great deal of aid and comfort in a person especially trained to help her administer tests, to help her interpret these tests, and perhaps to help her deal with some father and mother of a child whose parents may be a little bit stubborn about accepting this analysis and evaluation and making plans for the child 4 or 5 years hence to go to college.

This specialist is of great aid. And there are other factors in this guidance team.

We can see, for instance, the visiting teacher, and I believe our county has a visiting teacher of the casework type, that works in the homes with the children.

Here is a child that is a truant, and there may be a lot of reasons why he is a truant; the visiting teacher works on those, or on some other maladjustment of the child.

This visiting teacher would be a part of the team to sensitize the parents. That is, the counselor, the classroom teachers, the principal, the visiting teacher, working together to bring to bear upon the parents and the child that here is an opportunity, here is an educational future for you, here are reasons why we believe you have great potential in these areas. And when that process goes on for 3 or 4 or 5 years, right up to graduation, there is a momentum established; there are plans established; with the child who comes from a family that does not have a college tradition at all, their whole thinking is reoriented. We think this sort of process which has proven itself in our

best schools, those I spoke of awhile ago as being unsurpassed, will be among the essential ingredients to stop this waste of our brainpower, the 200,000 youngsters in the top part of our graduating classes who are not going on to college.

We think that the testing alone would not do the job. The classroom teacher alone cannot do the job. But all these factors in combination will do the job.

And in my little review here is something of the spirit of my feeling and my anxiety for this process that seems to us to be so essential to solve this problem.

Mr. PERKINS. Is it fair to say, Mr. Commissioner, that it would not be possible to get along with this whole job, however, if the testing tool were not part of it.

Mr. DERTHICK. That is very important to say that.

Mr. PERKINS. It is like testing soil. It does not give you the complete answer but you are away ahead if you know something about the soil. It is about the same with these youngsters.

Mr. DIXON. May I ask a question?

Mr. ELLIOTT. You may.

Mr. DIXON. The well-equipped school with counseling is less apt to accept just one of these important indexes of ability.

Mr. DERTHICK. That is a point extremely well taken. Our failure is oftentimes that we accept only one measure when actually we need all of these measures, and we need to interpret them with skill and professional ability.

Mr. Chairman, it might be a good point for me to interpret. You were asking about just how it would operate. I think one of the strongest features of these proposals lies in the State plan method of operation. We are all sensitive to the fact that in this country we have an educational system that is State and local controlled, and that is the way we want it to be. We have many people who are fearful of possible Federal interference and that is the last thing we want.

I wold like to say in the Federal Government, through the Office of Education, it is our mission to render assistance without interference and to exercise leadership without domination. In that spirit this plan is conceived, and among those who have studied it, who are the most zealous for the preservation of State and local control, there has been a good deal of enthusiasm for the approach we are making.

Now, the State plan approach is this. We identify a critical national need. Here is something that is heavily involved and charged with the national interest.

So we say to the State, "Here is an objective to institute a guidance and testing guidance and counseling system, tied in with scholarships, as one major attack on this critical national need."

Now, you people go ahead and make your own plans, you are going to run the show, you make a plan as to how you are going to meet this need in your State, and how you are going to administer this plan.

When they design a plan that will achieve this objective it is submitted to the Commissioner of Education, and it is just a matter of course for that plan to be approved.

Any relationship that we have between the Federal and State government at that point is a professional and advisory relationship in

which we might say to the chief State school officer in Alabama for example, who submits his plan: "Now, that looks like a very good plan. There are some fine features in it. You have a unique feature here."

"But we notice that over in Ohio, that they are doing this part of it this way," and we suggest to him that he might want to look into that.

So we have the States accepting and being charged with the responsibilities for designing the program and for administering the program, and our relation becomes then one of a professional nature.

Mr. ELLIOTT. Mr. Commissioner, suppose that you had 30 or 40 States come in with a plan. Then with $16 million would you have enough money to aid the States in getting the program started or is the idea to aid 2 or 3?

Mr. DERTHICK. No. We believe our plan is adequate to stimulate and strengthen these programs in the State, and I think this would be a good point, further, to answer your question to tie down the details of this package, and I think I will ask Mr. Richardson to read from the bill and to show how this money would be spread among the States.

Mr. RICHARDSON. Mr. Chairman, this will just fill in the legislative side of the picture.

You have been given, I think, a clear understanding of the reasons which make us feel that this is an important objective and a conception of the way in which practically it would be administered in relation to the State departments and local school systems.

I simply want to refer you to the provisions of the bill for this purpose.

Section 103 (a) of the bill would provide for an allotment to the States from which the Commissioner would pay to a State which applied for funds an amount equal to one-half of its expenditures for certain designated purposes. One would be for testing, second for salaries of additional supervisors of counseling and guidance personnel, for counseling and guidance training, either directly or through public or other nonprofit institutions, of persons who are employed full time or part time, by the State educational agency or a local educational agency in counseling and guidance of students in public secondary schools, and for salaries of additional counseling and guidance personnel. In addition to these purposes, funds would be available for the cost of administering the State plan.

Now, turning to the provisions that are necessary for the State plan itself, section 104, you will see that the language of the act is consonant with the Commissioner's statement that what we are doing, essentially, is to outline the purpose, leaving to the State the method of carrying it out, because all that the plan is required to do is to provide for its administration by the State educational agency; secondly, to set forth the State's programs and methods for the testing of students, which shall include provision for testing during each year of at least (1) all students in grade 9 or all students in a lower grade, and (2) all students in grade 11 or all students in grade 12, and also sets forth the State's programs and methods for the maintenance of testing and other student records, and for strengthening counseling and guidance of students.

(3) The State plan is required to set forth minimum qualifications for counseling and guidance personnel.

(4) To provide such accounting, budgeting, and other fiscal methods and procedures as are necessary for the proper and efficient administration of the plan.

(5) To provide that the State educational agency will make such reports to the Commissioner as are reasonably necessary to enable the Commissioner to do his job under the program.

So, within those very broadly stated purposes, the State, as the Commissioner has emphasized, would have discretion in developing a program in its own judgment best suited to its own needs.

Mr. ELLIOTT. Let us say, Mr. Richardson, that the State of Alabama, for instance, decided that the best way to get at this problem would be to train, we will say, just for illustrative purposes, one counseling and guidance person for each rural county, and, in order to do that, that it was necessary that these people take additional training at the State university or the teachers colleges, or wherever it might be practical to get it, and that that program would cost X dollars. Would that program of training these guidance personnel for the rural counties and the payment of those personnel be the type of activity that might meet the provisions that you have read in the proposed bill?

Mr. RICHARDSON. Yes; it would, Mr. Chairman; exactly that type of activity, and we think that the allotments provided for, insofar as we could develop some sort of yardstick as to the funds required, should be adequate for the purpose. This part of the act does not contain appropriation ceilings because it is difficult to foresee how much will be done by the States.

The first year's appropriation would provide, for example, to the State of Alabama for these purposes a total of $332,000. Translating that into half the salary of additional personnel in the counties and provision for training, we think that a great deal could be accomplished with those funds.

Mr. DERTHICK. It might be a good point, Mr. Chairman, to read into the record these tabulations of the amounts of Federal allotments and the specific data for calculating these allotments. May we do that?

Mr. ELLIOTT. You certainly may.

Without objection, they will be made part of the record.

(The information referred to follows:)

Basic data for calculation of Federal allotments under S. 3163 and H. R. 10278

Region and State	Title I, pt. A, enrollment in grades 9–12 in public and other nonprofit schools, 1955–56	Title I, pt. B, graduates from public or other nonprofit secondary schools, 1955–56	Title II, pt. A, enrollment in grades 1–12 in public schools, 1955–56	Title I, pt. A, and Title II, pt. B, enrollment in grades 9–12 in public schools, 1955–56
(1)	(2)	(3)	(4)	(5)
Aggregate, United States [1]	7,811,600	1,429,900	29,985,500	6,979,300
Northeast:				
Connecticut	98,000	18,600	355,000	77,000
Maine	48,000	8,300	162,000	36,000
Massachusetts	226,000	44,200	724,000	184,000
New Hampshire [2]	25,000	5,000	80,000	19,000
New Jersey	220,000	41,700	781,000	185,000
New York	679,000	117,900	2,246,000	569,000
Pennsylvania	[2] 512,000	100,500	1,683,000	[2] 431,000
Rhode Island [2]	32,000	6,100	103,000	21,000
Vermont	19,000	3,500	69,000	15,000
North Central:				
Illinois	412,000	77,700	1,364,000	346,000
Indiana	217,000	41,900	839,000	203,000
Iowa	143,000	29,700	504,000	129,000
Kansas	104,000	21,400	404,000	99,000
Michigan	336,000	65,700	1,219,000	285,000
Minnesota [2]	156,000	31,300	510,000	139,000
Missouri	191,000	33,500	706,000	168,000
Nebraska	69,000	16,800	232,000	62,000
North Dakota	34,000	7,000	125,000	31,000
Ohio	414,000	78,300	1,515,000	364,000
South Dakota [2]	33,000	7,200	123,000	31,000
Wisconsin	181,000	38,600	568,000	157,000
South:				
Alabama	160,000	26,800	733,000	154,000
Arkansas	95,000	17,000	419,000	93,000
Delaware	16,000	3,000	64,000	14,000
Florida	162,000	25,900	732,000	154,000
Georgia	175,000	26,100	906,000	169,000
Kentucky	137,000	22,800	591,000	120,000
Louisiana	146,000	24,900	593,000	125,000
Maryland	119,000	19,300	300,000	102,000
Mississippi	101,000	18,500	531,000	95,000
North Carolina	225,000	38,500	908,000	223,000
Oklahoma	131,000	23,900	489,000	128,000
South Carolina	107,000	17,200	563,000	105,000
Tennessee	166,000	28,000	755,000	158,000
Texas	387,000	66,200	1,745,000	373,000
Virginia	146,000	27,300	744,000	138,000
West Virginia	109,000	19,900	458,000	106,000
District of Columbia	30,000	4,200	101,000	24,000
West:				
Arizona	50,000	8,100	218,000	45,000
California	562,000	105,400	2,228,000	517,000
Colorado [2]	69,000	12,300	270,000	63,000
Idaho	38,000	7,000	145,000	37,000
Montana	34,000	6,500	125,000	31,000
Nevada	12,000	1,800	48,000	11,000
New Mexico	43,000	6,500	186,000	40,000
Oregon	88,000	16,200	330,000	84,000
Utah	48,000	9,200	189,000	47,000
Washington	144,000	24,300	535,000	127,000
Wyoming	16,000	3,200	66,000	16,000
Outlying parts of the United States:				
Alaska	5,000	700	30,000	5,000
Guam	2,400	300	12,000	2,400
Puerto Rico	78,000	17,200	545,000	67,000
Virgin Islands	1,200	200	5,500	900
Territory of Hawaii	60,000	6,600	109,000	54,000

[1] Refers to the 48 States, the District of Columbia, Alaska, Guam, Hawaii, Puerto Rico, and Virgin Islands. (American Samoa and Canal Zone not included.)

[2] Data for 1953–54 (most recent available in Office of Education from the State).

NOTE.—Data are the most recent available in the Office of Education, and for nonpublic schools are partly estimated.

Federal allotments under S. 3163 and H. R. 10278 on basis of appropriation requests for fiscal year 1959 [1]

Region and State	Encouragement of able students						Strengthening science and mathematics instruction	
	Testing and cumulative records	Counseling and guidance	Undergraduate scholarships				State educational agencies	Local educational agencies
			Amount		Number			
			1st year	4th year	1st year	4th year		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Aggregate United States	$9,764,500	$6,000,000	$7,500,000	$30,000,000	10,000	40,000	$10,000,000	$100,000,000
Northeast:								
Connecticut	122,500	66,109	80,394	321,574	107	429	118,341	1,103,000
Maine	60,000	30,908	44,160	176,639	59	236	54,004	516,000
Massachusetts	282,500	157,974	180,036	720,145	240	960	241,349	2,636,000
New Hampshire	31,250	16,313	22,646	90,584	30	121	26,668	272,000
New Jersey	275,000	158,833	202,682	810,729	270	1,081	260,351	2,651,000
New York	848,750	488,518	587,666	2,350,663	784	3,134	748,718	8,152,000
Pennsylvania	640,000	370,038	476,701	1,906,800	636	2,542	561,037	6,175,000
Rhode Island	40,000	18,030	30,195	120,779	40	161	34,336	301,000
Vermont	23,750	12,878	17,739	70,958	24	95	23,002	215,000
North Central:								
Illinois	515,000	297,061	377,434	1,509,738	503	2,013	454,697	4,958,000
Indiana	271,250	174,287	195,134	780,534	260	1,041	279,685	2,909,000
Iowa	178,750	110,754	128,328	513,311	171	684	168,011	1,848,000
Kansas	130,000	84,997	89,452	357,808	119	477	134,676	1,418,000
Michigan	420,000	244,689	338,559	1,354,235	451	1,806	406,360	4,084,000
Minnesota	195,000	119,339	144,557	578,230	193	771	170,011	1,992,000
Missouri	238,750	144,238	180,036	720,145	240	960	235,349	2,407,000
Nebraska	86,250	53,231	65,296	261,185	87	348	77,338	888,000
North Dakota	42,500	26,615	33,969	135,876	45	181	41,669	444,000
Ohio	517,500	312,515	381,209	1,524,835	508	2,033	505,034	5,215,000
South Dakota	41,250	26,615	33,969	135,876	45	181	41,003	444,000
Wisconsin	226,250	134,793	170,978	683,911	228	912	189,346	2,250,000
South:								
Alabama	200,000	132,218	180,036	720,145	240	960	244,350	2,207,000
Arkansas	118,750	79,846	100,775	403,100	134	537	139,676	1,333,000
Delaware	20,000	12,020	17,739	70,958	24	95	21,335	201,000
Florida	202,500	132,218	152,106	608,424	203	811	244,016	2,207,000
Georgia	218,750	145,096	195,134	780,534	260	1,041	302,020	2,421,000
Kentucky	171,250	103,027	164,939	659,755	220	880	197,013	1,719,000
Louisiana	182,500	107,320	150,974	603,895	201	805	197,680	1,791,000

See footnote at end of table

Federal allotments under S. 3163 and H. R. 10278 on basis of appropriation requests for fiscal year 1959 [1]—Continued

Region and State	Encouragement of able students						Strengthening science and mathematics instruction	
	Testing and cumulative records	Counseling and guidance	Undergraduate scholarships				State educational agencies	Local educational agencies
			Amount		Number			
			1st year	4th year	1st year	4th year		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
South—continued								
Maryland	148,750	87,573	114,363	457,451	152	610	100,007	1,461,000
Mississippi	126,250	81,563	132,102	528,408	176	705	177,012	1,361,000
North Carolina	281,250	191,458	245,332	981,330	327	1,308	302,687	3,195,000
Oklahoma	163,750	109,895	113,230	452,921	151	604	163,011	1,834,000
South Carolina	133,750	90,148	133,234	532,937	178	711	187,679	1,504,000
Tennessee	207,500	135,652	180,036	720,145	240	960	251,683	2,264,000
Texas	483,750	320,242	404,987	1,619,949	540	2,160	581,705	5,344,000
Virginia	182,500	118,481	172,488	689,950	230	920	248,017	1,977,000
West Virginia	136,250	91,007	115,872	463,490	154	618	152,677	1,519,000
District of Columbia	37,500	20,605	25,288	101,152	34	135	33,669	344,000
West:								
Arizona	62,500	38,635	53,973	215,893	72	288	72,672	645,000
California	702,500	443,874	472,926	1,891,701	631	2,522	742,716	7,408,000
Colorado	86,250	54,089	69,071	276,282	92	368	90,006	903,000
Idaho	47,500	31,767	32,837	131,347	44	175	48,337	530,000
Montana	42,500	26,615	29,062	116,250	39	155	41,669	444,000
Nevada	15,000	9,444	10,191	40,763	14	54	16,001	158,000
New Mexico	53,750	34,342	42,650	170,600	57	227	62,004	573,000
Oregon	110,000	72,119	70,580	282,321	94	376	110,007	1,204,000
Utah	60,000	40,352	42,650	170,600	57	227	63,004	673,000
Washington	180,000	109,037	103,040	412,158	137	550	178,345	1,820,000
Wyoming	20,000	13,737	13,965	55,860	19	74	22,001	229,000
Outlying parts of the United States:								
Alaska	6,250	5,000	9,058	36,234	12	48	10,001	72,000
Guam	3,000	5,000	9,058	36,234	12	48	5,000	34,000
Puerto Rico	97,500	57,523	135,876	543,506	181	725	181,679	960,000
Virgin Islands	1,500	5,000	1,510	6,039	2	8	5,000	13,000
Territory of Hawaii	75,000	46,362	23,778	95,113	32	127	36,336	774,000

[1] For the undergraduate scholarship program, data are also shown for the 4th year of the program (fiscal 1962).

NOTE.—Detail may not add to totals because of rounding.

Mr. DERTHICK. I might give you some further information just on Alabama.

These are allotments to Alabama for testing and cumulative records and counseling and guidance on the matching basis. The Federal part of the money would amount to $332,218, as Mr. Richardson said; then there would be allotments in the other field, the scholarships, the math and science. For example, for the State agency in Alabama to strengthen math and science it would be $244,350 and to local educational agencies, $2,207,000. But for the counseling, guidance, and testing the Federal part of the money would be $332,218, and we think that would go a long way toward giving Alabama a lift in these important fields. As far as the testing is concerned, it would be completely adequate.

Mr. JOHN A. PERKINS. It might be a matter of interest, Mr. Chairman, just what we have calculated for the first year for these several aspects of this program. For the testing program we have estimated that it would cost about $9,775,000, and that would be at the rate of $1.25 per pupil from the Federal Government.

Mr. ELLIOTT. This $9,775,000 would be half the cost?

Mr. JOHN A. PERKINS. Half the cost of the total program. Then for the counseling and guidance personnel, which would be to augment the salaries of those people to—well, there are a number of things mentioned here in the bill, for salaries of additional supervisors of counseling and guidance personnel, for counseling and guidance training, either directly or through public or other nonprofit institutions, of persons who are employed full time or part time by the State educational agency or a local educational agency in counseling and guidance of students in public secondary schools, or who are preparing for such employment, and for salaries of additional counseling and guidance personnel—you would have $6 million for that and $1 million would be available the State Department personnel for the supervisory personnel, and that gives a total of about $16,775,000 for this package.

The training of these people that you mentioned in universities and State teachers' colleges, and so on, would also be provided for. As I recall for that program there is about——

Mr. RICHARDSON. The funds are provided for training under two headings. There is one fund provided to the State agency itself which can be used for training of people in counseling and guidance. Then, in addition, there is a provision under section 105 for us to enter into arrangements with institutions of higher education for them to establish institutes or regular session programs to which counseling and guidance people can come for training.

Mr. JOHN A. PERKINS. That would be done directly by the Office of Education under the Commissioner.

Mr. ELLIOTT. Now we have covered, I think, in pretty good fashion this first section of the Commissioner's testimony.

I am just wondering if this would not be a good time to have such questions on this section as might be in the minds of the members of the committee who are present here today before we move on to the related question of undergraduate scholarships.

Mrs. Green.

NOTE.—Detail may not add to totals because of rounding. ...Scholarship program, data are also shown for the 4th year of the program (fiscal 1962).

Mrs. GREEN. I am not sure that this is the time or the place for this question, Mr. Chairman, but I noticed in your testimony that you are as anxious as are the rest of us to get the top brains, 50 percent of the top quarter of the high school graduates, into the colleges. The question arises as to what the colleges will do with the increased enrollment.

I was late, Mr. Chairman, because a member of the press called my office, informing me that this Sunday, in one of the papers, a solution will be offered that the women should be barred from the colleges. I have been coming to a slow boil for the last hour. This does not come out of your office, does it, Mr. Commissioner?

Mr. DERTHICK. No, indeed, and I am only sorry that other people with whom I deal are not so pleasant when they are in a slow boil.

Mrs. GREEN. This author is going to suggest that we cut down the number of women students in the colleges, and we admit only men, and in that way we will solve all the problems of the world.

Mr. DERTHICK. We think one solution to the manpower shortage is to get more women into our institutions of higher education.

Mrs. GREEN. I just returned from the Yale conference yesterday. That was the consensus there. What we needed to do was a real recruitment of brainpower among women who are not now in industry or science or business.

Mr. DERTHICK. Yes. In talking about our testing and guidance program, we have repeatedly made that point to each other that that is one of the great solutions.

Mrs. GREEN. Following this conversation I suppose I was particularly sensitive then about your reference to lazy John and conscientious Mary. It was not intentional, or was it intentional?

Mr. DERTHICK. Perhaps it should have been the other way around, Mrs. Green. Perhaps it should have said conscientious John and lazy Mary.

Mrs. GREEN. You are helping to simmer me down. I liked it the way it was. I thought I might use it in answer to this article that will appear Sunday.

I have no questions.

Mr. ELLIOTT. The gentleman from Massachusetts.

Mr. NICHOLSON. I do not know what you call these teachers. But it has been my experience that a great many of these teachers, men teachers, are not equipped to be principals of high schools. They are just there because they get a job after they get out of college. They have not prepared themselves for anything else, only just general education to get a degree of some kind and start teaching. Do you find that so in going around, Mr. Derthick?

Mr. DERTHICK. I think, Mr. Nicholson, that there has been a very fine upgrading among the school administrators in this country. I think there have been great improvements, in recent years, in experience and training of these people and training on the job.

Mr. NICHOLSON. Do you think we need training?

Mr. DERTHICK. Pardon me.

Mr. NICHOLSON. Do you think there was need for it?

Mr. DERTHICK. Oh, indeed, we have had much need for self-improvement and professional growth among the school administrators, but that is true in industry and every walk of life. Almost every in-

dustry I know is concentrating on in-service training to develop people so they can operate at a more effective level.

Mr. NICHOLSON. What I am getting at is: These teachers are not teachers. They are just somebody holding down a job. That is all, and they never will be teachers. For the young fellow from 13 to 17 or 14 to 18 for the young girl, either, a great deal depends on who is principal of that school or who is teaching them as to what they take up in the schoolhouse.

Mr. DERTHICK. I agree with you heartily. We have to begin with the good teacher and the good principal. The principal can set the climate of the whole school, and the community for that matter, just as the teacher sets the climate for the classroom.

Mr. NICHOLSON. This testing should start in, I think, not for the pupils but testing with the fellow who is going to test them.

Mr. DERTHICK. Of course, we hope to get our share of teachers out of these bright young people we are going to salvage and send to college.

Mr. NICHOLSON. Nothing has been done about them. You know. I do not have to tell you, because you are an educator. There are thousands of men who go to college just to graduate from college, so that he will be pointed out going down the street as, "There is a college graduate," and he cannot do anything. He may be able to teach school if the curriculum is laid down by the school committee of State law or something. But no one can be successful unless he is interested in it.

Mr. DERTHICK. Mr. Chairman, I think Mr. Nicholson and all of the committee would be interested in this little illustration of some of the indirect values of testing. Now this illustration does not cover our whole program of guidance and counseling, but it is rather significant. May I read it?

Mr. ELLIOTT. You may.

Mr. DERTHICK (reading):

> The Oklahoma Frontiers of Science program has demonstrated that there are many indirect values which may be derived from an extensive testing program other than the mere identification of talent and the prediction of school achievement.
>
> In a program designed to encourage bright high school students to pursue scientific curriculums, some 60,000 high school students were given a battery of tests. All students who ranked in the upper 20 percent were sent congratulatory letters from Frontiers of Science. The following year enrollments in high school physics courses increased over 200 percent statewide with some schools showing even greater increases. The same thing was true in the case of chemistry courses. One school showed an increase from 25 to 75 students taking chemistry. The increase in mathematics enrollments was not as great but was substantial. Algebra and plane geometry were up approximately 25 percent.
>
> Numerous cases of individual students who were quite able but were not being challenged in school and who had developed poor work habits and were causing disturbances in school showed marked improvement after being recognized in this program for their true abilities. Counselors reported that once the facts were known there was little difficulty in encouraging students and their parents to make appropriate educational plans including a strong academic background of mathematics and science.

We think that if we can get this program enacted we are going to see a tremendous revival of interest and great response on the part of our young people to scholarship. They are very idealistic and sensitive to these fine values if we can awaken them. I believe this is just

one little sample of the sort of thing that is going to happen nationwide.

Mr. NICHOLSON. Now the chairman was talking about his county down in Alabama, and I have a county that I live in and my county does not have anything to do at all with the schools. His does.

Probably there are 8 to 10 schools in 1 of his counties, and I suppose the counties are assessed or chip in to pay their share of the bill. It is not so in my State. My county has nothing to do with it at all, and the State does not give the town or the city anything. We just raise it by taxation.

Mr. DERTHICK. But this program, Mr. Nicholson, is designed to fit into whatever may be the State and local school system.

Mr. NICHOLSON. You are going to hire somebody?

Mr. DERTHICK. Your local school authority would do that.

Mr. NICHOLSON. I mean under your bill. They are not doing it now. We do not have anybody who goes to the pupil and says: "Look here. You will waste your time here unless you go to college. You have everything there is for it." A boy or girl naturally goes for flattery; and, if you tell them they are smart, they will almost believe it themselves.

Mr. DERTHICK. It might be helpful, Mr. Nicholson, to ask Mr. Richardson, who is a native of your State and a citizen of your State, to tell how he thinks this program might operate in Massachusetts.

Mr. RICHARDSON. Well, I am not an expert, Mr. Nicholson, and I would not want to try to second guess the communities in Massachusetts on how they might decide they ought to go about this. But I think that there is a need in Massachusetts, as elsewhere, for the organization of many activities on a regional basis where schools are too small to support them on their own. In the case of a large high school, this program would finance half of the cost of salaries of counseling and guidance personnel in addition to any they may already have. Where it would be uneconomical for a single school to employ such a person on a full-time basis, one way to do it would be for a group of schools to get together and decide that it would be helpful to have such a person rendering services to the teachers with counseling responsibilities for all the schools in that area. The State plan worked out between the schools and the State department of education in Massachusetts might make that kind of provision.

I merely mention that, though, as one way in which it could be done, even in the absence of any county organizational setup. In any case, as the Commissioner emphasizes, what we are doing here is standing ready to provide matching funds for the purpose of stimulating the States to find ways to do this job. I feel sure that the communities in Massachusetts, the local towns' school committees and the town meetings, the board of selectmen, if they know that these funds are available and recognize the need, will have the ingenuity to devise ways of getting the job done.

Mr. NICHOLSON. This is bound to put a lot of people to work, is it not? I mean throughout the Nation?

Mr. RICHARDSON. We hope that it will.

Mr. NICHOLSON. Well, when I graduated from high school, we had three teachers in the whole school. I do not know how many pupils

there were 100 maybe. Now that there are about 15 or 20 teachers, the pupils should be 15 or 20 percent smarter, but as far as I can make out they are about the same as we were. I suppose the grade-school children will be just the same.

But there is a limit to where we can go on a provision for the schools. For my town and I suppose every town in my district, half of the money raised by taxation goes into the school system. Now there must be something wrong. I mean where you had three school teachers taking care of a high school, and then 30 or 40 years afterwards you get 15 or twenty teaching the same subjects, only now we have the benefit of one teacher teaching arithmetic, one teaching algebra, one teaching languages, and the teacher just concentrates on one thing.

Why are the school teachers not getting twice as much in results where they have only just a small group to teach, rather than the whole schoolhouse?

Mr. RICHARDSON. It may be that they are, Mr. Nicholson. But I think from a national point of view the important thing to recognize is however good a job we may be doing in dividual areas, as a Nation we are not doing a good enough job to meet the requirements of national security at the present time.

We recognize shortcomings, and we recognize also that Federal matching funds programs having again and again demonstrated the ability to stimulate the communities which have primary responsibility for these kinds of things to take the action necessary to correct the things that they themselves often recognize to be shortcomings, but which without the benefit of Federal matching funds they might not so soon get round to correcting. That is essentially the basis of this program.

Mr. NICHOLSON. Of course, under our system now as I just pointed out a minute ago we are paying about 50 percent of our taxes for the schools.

Now, you say it comes out of Federal funds. Where do the Federal funds come from? I wonder if the committee that studied it realized that that money comes out of my town and your town.

Mrs. GREEN. Would the gentleman yield?

Mr. NICHOLSON. Yes.

Mrs. GREEN. Mr. Commissioner, could you tell me the percent of the national income that was spent on education this last year?

Mr. DERTHICK. Let me ask Dr. Conrad.

Mr. CONRAD. About 4½ percent for the school year 1953–54.

Mr. DERTHICK. About 4½ percent.

Mrs. GREEN. About 4½ percent. What percent of the national income was spent on education say in 1939?

Mr. DERTHICK. Do you have that figure, Dr. Conrad?

Mr. CONRAD. It was a slightly smaller figure.

Mrs. GREEN. We were spending more 20 years ago——

Mr. CONRAD. Yes, proportionately more——

Mrs. GREEN. On education. This includes all Federal, State, and local expenditures? We were spending more in 1939 on education?

Mr. CONRAD. Proportionately.

Mrs. GREEN. We were spending more in 1939 on education compared with the national income than we are today. Of course, we have a tremendously increased school population.

Could you tell me what percent of the national income the Russians are spending on education?

Mr. CONRAD. No. I am afraid that figures on national income in Russia are almost the property of the CIA. They are not readily available.

Mrs. GREEN. I thought I saw some figures last year on what percentage they spend.

Mr. DERTHICK. There have been various estimates, Mrs. Green. We would not want to be in a position of presuming to give authoritative figures because no one really knows; but some of the estimates go as high as 12 percent.

Mrs. GREEN. Did I understand you to say that these figures were only available to CIA?

Mr. CONRAD. No, I think the most accurate would be available there. There are figures that are published by UNESCO for example, but the degree of accuracy is certainly subject to considerable question.

Mrs. GREEN. Mr. Commissioner, if I may say so, I think that first of all, that part of the bill having to do with guidance and counseling is one of the most essential parts of the educational program, and the good teacher at high school or elementary level is to me the difference between success or failure.

If I have any criticism to make of the administration bill, it is because it does not recommend enough in the way of Federal expenditure.

Last year the administration recommended $300 million for a classroom program, and 12 months and two sputniks later, the administration recognizes the urgency and the emergency by recommending $250 million a year, I as one member of the committee feel that the amount that we are spending on education in this country is not sufficient. I base this not just on the desire to catch up with the Russians. I deplore the statements that are made so many times, not only in education, but in other phases of our activity, that if the Russians do this, we have to do this.

I think this is not the basis for wise planning, but rather what, in the long run, will be best for the American way of life.

I would like to see the administration recommend a greater program.

Mr. NICHOLSON. Are there any statistics on how much is spent for education by each city, town, and county throughout the United States?

Mr. DERTHICK. Yes. Those figures could be assembled.

Mr. NICHOLSON. Have you any idea how much?

Mr. DERTHICK. We know what the total education bill is in this country. Dr. Conrad can give you that figure.

Mr. CONRAD. For public education it is about $16 billion; elementary, secondary, and higher.

Mr. NICHOLSON. How much was that 10 years ago?

Mr. CONRAD. Of course, the value of the dollar has changed a good deal.

Mr. NICHOLSON. Leave the value of the dollar out of it. A dollar is a dollar.

Mr. CONRAD. I will have to check that. As we all know, the amount of money spent will depend upon the number of pupils, and, as you know, the number of pupils has increased enormously. But really, I believe what you are inquiring about, if I may presume, is the expenditure per pupil now, as compared with previous years.

Mr. NICHOLSON. All right.

Mr. CONRAD. I think I can get some figures on that. The expenditure, Mr. Nicholson, has gone up, just as the standard of living has gone up in other areas, the cost of education has also gone up.

Mr. NICHOLSON. Of course, we built a couple of schools that are bonded. We have paid off some of it. It is a million-and-a-half-dollar expenditure for a little town. That is not included when they make a return to the State, or anybody else, in the price of education per pupil. That comes out of the city treasury, and not schools, and is not included in how much we pay per pupil. In other words, if we spend $500,000 in our budget to operate the schools in my town, that is just for maintenance of the school and the salaries of the teachers. It has nothing to do with the buildings that we erect or anything like that.

Mr. CONRAD. Massachusetts is a little unusual in that way. The towns and the cities do provide the capital outlay funds. We have the State department and also the local communities to include that in their statement of educational expenditures. I believe that in Massachusetts this is not done perfectly, so we have certainly made an attempt to get the capital outlay expenditure into the grand total for Massachusetts, and every other State.

Mr. NICHOLSON. It is not being done. It is not an accurate picture of how much we are spending for education if you take the buildings into that proposition, which they do not do.

Mr. CONRAD. In the figures which we collect we make an effort to do that. We are aware that the figure for Massachusetts is an imperfect figure. We are in correspondence with the State department on that very matter.

Mr. NICHOLSON. If you say "per pupil cost," it is just as good to me.

Mr. CONRAD. The current expenditure per pupil in 1944 was about $117 in the United States. In Massachusetts it was $161.

This has gone up for the Nation as a whole, and in 1954, 10 years later, it was $265. In Massachusetts it was about $300. It went from $160 to about $300, in Massachusetts.

Mr. NICHOLSON. It has doubled then in the last ten years.

Mr. CONRAD. Yes, in current dollars, without taking into account the change in value of the dollar.

Mr. JOHN A. PERKINS. The dollar, Mr. Chairman, and Mr. Nicholson, in that corresponding time, has depreciated about the same amount as the number of dollars has increased, so relatively I gather the expenditure is about the same. Is that not true, Mr. Conrad?

Mr. CONRAD. The expenditure is higher, now.

Mr. JOHN A. PERKINS. Even after allowing for the dollar depreciation?

Mr. CONRAD. Yes. What you have to remember, it seems to me, is that there is continual improvement of the quality of the teachers that are going into teaching. The teacher today is a much more professional person than he or she was 10 or 20 years ago. This is part of the improvement of the quality.

Another development which has cost money is the diversification of curriculums offered to the pupils. In other words, instead of putting all the pupils in the same mill, a variety of courses is offered. This results in somewhat smaller classes.

A third factor to consider is the increasing proportion of pupils that go to high school where costs are higher than they are in elementary schools, so there is a variety of factors.

In my judgment, the improvement of the qualifications of teachers and the rising standards in education, as in other aspects of American life, account for some of the increases in costs.

Mr. NICHOLSON. I guess that is all, Mr. Chairman.

The CHAIRMAN. The committee is very happy to have with us one of the chairmen of its subcommittees, the gentleman from Georgia, Mr. Landrum.

Do you have any questions, Mr. Landrum? If you do, we will be happy to have you ask them.

Mr. LANDRUM. Thank you, Mr. Chairman.

What we are directing our conversation and efforts toward here, I believe, is principally the secondary school program, it is not, Mr. Commissioner?

Mr. DERTHICK. Yes, sir, principally the secondary school.

Mr. LANDRUM. Yes.

Is it not true that the function of a secondary school is to impart knowledge of specific fundamental subjects to the individual students? Is that not the primary function?

Mr. DERTHICK. I would say that is one of the functions.

Mr. LANDRUM. I dislike to employ a cliché, but it is true that the primary function is instruction—or should be instruction—in the three R's, is it not, Mr. Derthick?

Mr. DERTHICK. That is right.

Mr. LANDRUM. Is it not also true, Mr. Commissioner, that through the last 20 to 25 years the basic fundamental high-school curriculum has been invaded, as the gentleman here just a moment ago said, by a great variety of courses that has tended to at least weaken the opportunity of the individual child to be schooled in the fundamentals that we call the three R's?

Mr. DERTHICK. I would not say that is true in the best schools at all.

Mr. LANDRUM. Generally speaking, it would have to be true; would it not?

Mr. DERTHICK. The reason for the diversification of courses is not to take away anything from those youngsters who have heretofore been in school, but to take care of the widely varying abilities and interests of the vastly increased numbers.

Mr. LANDRUM. Now, Doctor, we are getting into what, so far as my thinking will let me believe, is one of the real problems in the field of education today.

We have sacrificed the necessary fundamentals and basic points of an educational program, of a curriculum in high school, in order to have some attraction for all pupils, and kind of let them govern what they want to take, rather than telling them in their formative years what they should take.

Is that not true?

Mr. DERTHICK. Of course, if you want my philosophy and point of view about it, I am a stickler for hard and thorough work in the schools. I think any conscientious teacher is. We want to increase the emphasis upon solid subjects and upon scholarship values, not decrease it.

Mr. LANDRUM. I believe that to be true about you. As a matter of fact, if I may be permitted an aside here, I will say that one of the pleasing things about your appointment, to me, was that I believed that to be your philosophy.

Mr. DERTHICK. Thank you, sir.

Mr. LANDRUM. I observed some of your work long before I thought you would ever come to this menagerie up here.

Coming back to my question, though that is your philosophy, and I believe the aim of every real honest-to-goodness thinking American, is it not true that we have been graduating vast numbers of boys and girls who were simply not equipped, upon graduation from high school, to go into the study of science, engineering, mathematics, or even some of the fine arts courses? We graduate them with a high-school background that simply does not equip them to do that. Is that not true?

Mr. DERTHICK. Our program, of course, is designed to bring the curriculum back into balance, as far as these subjects are concerned.

Mr. LANDRUM. To the extent that your program does that, I want to support it completely; to the extent that it will do that. What I am driving at is this: I am apprehensive that such a testing program that you are advocating here in this legislation, and as you have outlined in your statement, will do what has been done over the last 25 years, accumulate a whole lot of paper and show our attitude and goal to be that of testing aptitudes rather than testing knowledge.

What good is it going to be to test aptitudes if there is not a corresponding amount of knowledge?

Mr. DERTHICK. I agree with you exactly. We need to test both, and that is what we propose to do.

Mr. LANDRUM. We come back to my original question: Irrespective of a child's aptitude in the general or secondary-school program, is it not the wisest course one that would give him an opportunity to dig into the fundamental high-school mathematics, the fundamental grammar, fundamental science, the physical sciences, the exact sciences? Is that not a better program than trying to develop just exactly what the score in his aptitude is in his early life, and then channel him into that?

We increased our cost and we do not get a corresponding amount of results.

Mr. DERTHICK. Our program is right down your alley. By far the greater part, $110 million of our program of this particular $145 million we are talking about is designed to do the thing that you want to see done—to strengthen.

Mr. LANDRUM. I hope that is true.

Mr. DERTHICK. That is true.

Mr. LANDRUM. But I am not convinced yet.

Mr. DERTHICK. Mr. Nicholson sometimes speaks in terms of dollars—it is $110 million.

Let me tell you, then, about our program to strengthen mathematics and science—we have not come to that in the testimony yet.

Mr. LANDRUM. I have seen the others. I want to stay, if we can, right to this section on the testing program.

Mr. DERTHICK. All right.

Mr. LANDRUM. And your guidance program.

I think your testing program, as outlined here, and the counseling and guidance program, as outlined here, so far as I am able to see now, will have just about as much real value in solving the fundamental problem before us today in secondary education as it would be to spend the same amount of money to buy a room full of papers and stack it up in the attic of a State capitol or a State department of education, or down here in your building in your Commission.

I want to ask you what earthly good is it going to do to find out what Lazy John's aptitude is in the eighth grade or the ninth grade—and I was one of them and still am—and have it filed away in the attic somewhere, and Lazy John, because he does not have these fundamental knowledges that we say are necessary, is never encouraged to go on to college?

Mr. JOHN A. PERKINS. Mr. Chairman and Mr. Landrum, as a sometime university president, I am very much interested in this problem, and especially from the substantive standpoint of getting these youngsters into college who ought to be there by reason of their native ability. At one time they did constitute the great majority of those youngsters who were in our high schools.

As has been brought out here, in recent years the whole population of youngsters between 14 and 18 in high schools has vastly increased, and the high schools have necessarily had to proliferate their programs to accommodate all types of youngsters that have lately come in.

Mr. LANDRUM. Is that not wrong?

Mr. JOHN A. PERKINS. The high school population has increased.

Mr. LANDRUM. I know that is right, but I am talking about your last statement, that because of this increased enrollment the high schools have had to vary their curriculum.

Mr. JOHN A. PERKINS. No, I do not think so.

Mr. LANDRUM. It is wrong. Why does the number of pupils influence the variations in your high school curriculum?

Mr. JOHN A. PERKINS. Well, you see, in the early years of our high school development in this country, those who stayed and did not quit school and go to work, were youngsters who had a more academic orientation. That is, they wanted school. They wanted, perhaps, to go on to college. That was the purpose of virtually all of them, anyway, being in high school.

Mr. LANDRUM. Doctor, you are coming to the very point with which I disagree, and with which I think many Americans today disagree, and that is that we must follow the so-called life adjustment theory to the point of having in the curriculum that which will satisfy those boys and girls who do not want to take those difficult subjects.

The average boy or girl, yours, mine, or anybody else's, is going to take the line of least resistance if he is not properly directed by home and the faculty.

Mr. JOHN A. PERKINS. Now you are coming to the very reason for this counseling, testing, and guidance.

Mr. LANDRUM. If that were it, I would accept it, but I cannot see from your testimony here this morning, and from all that I have been able to read, that that is the goal. The goal seems to be just what you said previously, to get a child's aptitude, and once finding his aptitude, vary that curriculum to suit that aptitude.

On the other hand, I think you ought to have a fixed, rigid curriculum in the high school on the secondary level, and subject these boys

and girls to that for 2, 3, or 4 years, and then come in with your guidance programs. They are going under compulsory attendance law, and then see whether they need to go to a vocational school, or see whether they need to go on to a field of engineering, or whether they need to go to schools that specialize in fine arts.

But, to do this down on a high school level appears to me to be wasting money. I want to say something here about money. I am not one of those who believes that we have got to measure our educational program in terms of dollars and cents. I think rather we must tell ourselves we cannot afford not to spend it if it is money we need, but don't kid yourself, we are not going to solve these problems by an appropriation of a great deal of more money, we are not going to get the desired results if we depend on money alone.

Mr. JOHN A. PERKINS. I agree with you entirely. You and I might agree, too, that we ought to have the old-fashioned curriculum and the solid subjects. We do not feel, and it has never been the belief in this country that the United States Office of Education backed by legislation of the Congress ought to tell Georgia or my own State of Michigan what it ought to do about this curriculum. We have in a few particulars.

Mr. LANDRUM. I agree with you there but, if we follow the design laid out in your guidance programs and reach its ultimate, we will have done exactly what you say you do not want to do.

Mr. JOHN A. PERKINS. I do not think so.

Let me explain further a bit. We have got these varied curriculums in these high schools—whether we might like it from our viewpoint or not. I was a Lazy John, too, I assure you. We might not tend to take the courses that we had the native ability to take. We would slide off, we will say, into auto mechanics, offered through the vocational educational program, because it looked as if it took less time after school—at least on homework—than a course in physics. That is what we do—take the path of least resistance, but by the testing process they would catch up with this, so to speak. They would find out that we had the aptitude, and the native ability, to take these hard courses, the solid subjects, the traditional courses that the high schools originally gave in great part.

If these tests were just taken and filed away in the principal's office, they would not do any good, just as you say they would not. But, with the staffing of the high schools, with the counselors, and alerting the whole high-school staff, every last teacher, to the importance of counseling and guidance, we would hope that these test results would be brought to these youngsters, to the attention of us Lazy Johns, and even to the attention of their parents, and everyone else interested in it. We would have the pressure, so to speak, brought on us—not by the Office of Education, but by our local high school principals and teachers, to get in the kind of courses that we, because of ability, which I will assume for both of us, ought to be taken, in preparing ourselves ultimately to make the contribution to the country and to our own individual and family prosperity that we are reasonably capable of making.

If the counseling does not follow upon the testing, we will just accumulate tests that will not be very well used.

On the other hand, if we have the testing and do not have the follow-through and the counseling, there will be a waste of another kind.

I do not see how we are going to overcome this difficulty which you identify so well, unless we go at it through this route.

We are not in a position, and I do not think anyone would probably suggest that the United States Government ought to legislate a curriculum for the high schools throughout the country, of the so-called hard subjects which, indeed, are so important to the national security.

That is why we follow this testing, guidance, and counseling program, which we hope will, as the Commissioner will explain in his testimony, in a few minutes, give some stimulation to better teaching, and in the science and mathematics programs.

They have been at a disadvantage, as we explained the other day, Mr. Chairman, in bringing to teaching positions the same quality of people that we have long since had, and are able to get, even today, in the English field, in the history field, and so on.

Have I gotten at all to a point of commonality, we might say, in our thinking?

Mr. LANDRUM. I understand what you are talking about. I do not agree with you, I will be perfectly frank with you, and I will add this: How are you going to discover from those tests and this guidance program that we speak about that Lazy John in the ninth grade, is not able to take and understand as he could the high-school algebra, the high-school geometry, the high-school physics or chemistry, when that child, for some inherent reason, may be slow maturing? How are you going to take care of the fact that you take a child at that stage of the game and tell him to go over here, instead of going over there, and not destroy potential great scientists or potential great orators or a potential great minister?

We cannot concentrate these things and make these boys and girls start specializing in the beginning.

One of the greatest generals in this country, that this country has ever produced is General Wedemeyer. I do not mind calling him by name. My information was that he was sixth from the bottom in a class when he graduated. He just barely got by.

The gentleman who is in the White House today was 16th from the bottom, I understand. Where is he now?

What would an aptitude program have shown about those gentlemen? Yet they have reached the heights of all success that could be expected of them.

I say that if we will take this $24 million that you estimate for an annual expenditure in the fourth year of your guidance program and add to it a sufficient amount of funds to equip the high schools with the physical equipment necessary to teach these fundamental subjects, that you will gain far more than you would from any so-called guidance program.

Mr. DERTHICK. Mr. Landrum, may I speak?

I think we are getting right down to a point of discussion that is exceedingly valuable. I believe that you are very conscientious in your views, and we are, too, if we could just get over the thing that we are trying to drive at because we are, essentially, after the objective that you seek.

A moment ago I read into the record the report on the program in Oklahoma, how their testing program increased the enrollments in science and to some degree, in mathematics.

Mr. LANDRUM. I have one question in regard to that. I am familiar with that Oklahoma program. I have tried to study it.

What is to hinder the dissemination of such knowledge of accomplishments as that, to the general education program in the high school, rather than having specific plans, such as you designate here?

Mr. DERTHICK. Let me answer that by giving you another example right here in the District of Columbia.

The practical significance of the early identification of abilities is illustrated by a recent study made in the District of Columbia. It was found that in the spring of 1957 there were nearly 1,200 students enrolled in curricula below the academic level most appropriate for their ability.

Mr. LANDRUM. Just a minute, Mr. Derthick, please, sir.

Mr. DERTHICK. May I finish this?

In other words, the tests provided the means for identifying students who were taking easy courses—

you do not want to see it happen, and we do not want to see it happen—

when they were capable of taking much more difficult courses which would enable them to better prepare for education to go on to high school—

the tests showed that situation up and put the teachers and the principal and the guidance people in a position to work with those students and their parents to get their courses changed.

Mr. LANDRUM. If you could cite some school system other than the District of Columbia, with such statistics, I would attach more value to those statistics than I do. The school situation in the District of Columbia certainly is not one that would deserve to have its weaknesses or its strengths compared to the rest of the country.

Mr. DERTHICK. We have a good many other examples.

Mr. Richardson?

Mr. RICHARDSON. I would like to call to your attention a report by the Joint Committee on Atomic Energy of the Congress, published on July 12, 1956, and signed by all members of the joint committee.

Under the heading of "Major Recommendations" the committee stated that:

The principal * * *

they put this as the first need—

* * * need in order to overcome a shortage of scientific and engineering manpower is a stronger program for identifying the ablest students in our high schools at an early age, and presenting them with challenging courses to stimulate their minds.

They go on to say that:

Listed below are a few of the major recommendations made to the committee that illustrate the types of approach which might assist in meeting these requirements:

and the second one is:

Earlier identification of potentially abler students. At present only 4 out of 5 students in the top quarter of their class finish high school. Only 2 out of 5 in the top quarter go on to college. Many with high potential simply do not enroll in college preparatory programs. In order to recoup this loss of potential talent it is proposed that statewide testing start at the eighth or ninth

grade level, rather than the twelfth. This would help insure that the abler student did not drop out of school, and that they take the kind of courses necessary for college entrance. Increased emphasis should also be placed on intellectual rigor for the abler student and challenging programs provided.

As others have pointed out, Mr. Chairman and Mr. Landrum, we cannot directly provide the more challenging programs, but we can provide stimulus to carrying out the kind of things which were pointed to in that report as urgent national requirements.

Mr. LANDRUM. Mr. Richardson, I am familiar with the paper that you read from. This may be a paradox, but, as I said, I agree with most of it. However, I come right back to this point, that I am afraid, and really apprehensive that your proposed guidance and testing program is one that will result ultimately in a compounding of all of the mistakes that we made in these high school curricula in the past 25 years, rather than improving it, for I firmly believe, although I do not like to measure it in dollars and cents, that the American public is not going to stand for much more taxes. They are not going to stand for much more public expenditure until they see some results.

Such a program as you propose will inevitably increase the cost of teaching in the high schools to more than double what it is now. We must concentrate these high-school curriculums in the basic field, and do the other when we get to the higher level, that is my feeling.

Mr. DERTHICK. Let me give you something that is impressive to us on the President's Committee on Science and Engineers that bears on this. It talks about the identification and motivation of youth.

The adequacy of our future supply of qualified scientists and engineers will depend in large measure on our success in identifying young people with the necessary aptitudes, and our effectiveness in motivating and assisting them in taking the optimum training to realize their potentialities. As its first step in developing these programs with these ends in view, the President's Committee commissioned and published a survey of existing studies on identification and guidance, a bibliography of publications in this field.

Then it goes on to develop that point.

With regard to those two distinguished personalities in our national life whom you mentioned, who came to the top without this aid, I think we will always have exceptional people who, despite handicaps, will find their way to the top. Certainly, they went to an institution where there was a very highly selected student body. Certainly, as we think of the millions of our youths, we need to have these techniques in order to identify ability and in order to give them direction in the way that they can achieve their highest potential.

I am convinced that this program of testing and guidance, of early identification of talent, will do more than any other one approach to strengthen our high-school curriculum and to increase enrollment in these fields that are of concern to you and me.

Mr. LANDRUM. If we can confine it to the local high school, I will agree with you completely, 100 percent, because I believe that there is no substitute for what someone here referred to this morning as "teacher judgment."

Mr. DERTHICK. I said that.

Mr. LANDRUM. Yes. There simply is no substitute for that, in determining what the child can or should do. If you let this teacher and this pupil come to rely on such a program as this, I am afraid that we will compound all of your errors. I hope I am wrong. I do not

mind being wrong. Mr. Chairman, I will not intrude further. I have consumed too much time, not being a member of the committee.

Mr. DERTHICK. May I just say to Mr. Landrum, Mr. Chairman, that I think he has stimulated a very valuable discussion, and we are indebted to you. You and I realize that the teacher is the key to the situation. Our best teachers need this program. They are asking for this program and using this program. A program like this, if it is not handled by capable people, can be the sort of confusion that you describe, but if you and I could visit some of our best schools and see the program in effect, where it is in the hands of capable people, it would be very convincing to both of us.

Mr. LANDRUM. Perhaps so.

Mr. ELLIOTT. Thank you, the gentleman from Georgia, for your contribution.

I will recognize the gentleman from Massachusetts.

Mr. NICHOLSON. There have been some mistakes made in this educational program, and I would like to know who is to blame for not having these basic subjects in the schools that we had. Now they take whatever they want to, and not what was required of them, as the gentleman from Georgia said, 25 years ago, where they had to take arithmetic, algebra, geometry, and they had to take history. No one was educated unless they had 4 years of history, and 8 would be even better.

I cannot understand why we come in and ask for these tests when we know that those basic things have got to be taken up by the pupil. If he cannot do arithmetic, certainly, he is going to wind up in some vocational training school or training place where he can work with his hands instead of his head. These children are not qualified to go to college because they do not know anything about mathematics. They may have a smattering, but it is in the background. Those things are basic education.

He talked about the two generals. I talked about my daughter the other day, who was in the bottom grade in school when she finally got a degree, and then a couple of years afterward she went to Smith and got another degree and was practically on the dean's list. They were on the bottom of it—but I suppose that is aptitude. I would like to know who is to blame for doing away with these curriculums that were required years ago, and are not required now to get a diploma.

Mr. DERTHICK. I think Mr. Richardson has a comment he wants to make, and then I will be glad to react.

Mr. ELLIOTT. The chairman will recognize Mr. Richardson.

Mr. RICHARDSON. I would like to say this, Mr. Nicholson, in this context:

It seems to me the praise or blame for where we are now and, certainly, some of both could be passed around, is not really the central problem we have at hand. The question is: Recognizing deficiencies in our educational system as measured against the challenges ahead, what can we or should we do about it?

We in the Federal Government cannot by any conceivable program do the whole job, or, perhaps, even the most important part of what is necessary to raise standards and to inculcate respect for intellectual achievement, but I think we would say that the program we have,

taken as a whole, converges on that problem from a number of different directions.

We seek to stimulate work in hard subjects by able students through the testing, counseling, and guidance programs. We seek to give incentive for hard work and intellectual achievement through the award of scholarships on a competitive basis.

We think the very institution of a system of competitive scholarships will help in every community of the United States to give the feeling that it is important and desirable and recognized to excel in high-school studies.

We, at the same time, are proposing to strengthen teaching of 2 of the most important basic subjects, the 2 most clearly related to national security; namely, mathematics and science. We are seeking to stimulate better teaching of languages. We are seeking, in addition to all these things, to do something about the problem of providing qualified teachers for the colleges where these able students are going to go.

These are the kinds of things which we can do as a Federal Government, with limited amounts of Federal funds. They all lead in the general direction of trying to make possible provision for stronger education and at the same time to provide the motivation to seek it.

We feel that it is only through this kind of approach that we can do it. We do not say that this particular combination is the very best combination that might be put together. The committee has before it the recommendations made by Mr. Elliott in his own bill, and we hope that the testimony brough out before the committee will suggest other ways of attacking the problem. I do say, though, and I think it is important to realize, that no Federal programs can do the whole job, or even a very major share of it. They can help.

The issue we really have is: Should we, as the Federal Government, stand by and say we cannot do anything about this at all, or should we say we will undertake to do those things through stimulation of Federal programs that are appropriate for Federal action, recognizing always that the primary responsibility is a State and local one?

Mr. DERTHICK. Mr. Chairman, I think that I would like to stand on Mr. Richardson's answer. He has given, better than I could, the answer that I would like to give to Mr. Nicholson.

Mr. NICHOLSON. I still have not any answer to my question. I want to know why we have made these mistakes. We can go back, because we learn from experience. Our experience is the school situation is that boys and girls graduating from high school—I do not know how many points are required now, I will say it is 20; that is what it was when we graduated, anyway—they do not know the subjects at all, because they ducked them. They have got to have these things, otherwise all the bills we put in for science and arts and everything else cannot do it, that's all, because they do not have any groundwork in it.

Mr. DERTHICK. While all of us parents and other citizens and teachers have been making mistakes, we have also developed some mighty fine schools in this country; our program is designed to strengthen and to bring them into balance.

We will always be concerned about adjustments for balance. Our program is designed to bring things into a better balance, in light of the needs of the times.

I do not think there is any additional contribution that I could make beyond that, in addition to what Mr. Richardson has said.

Mrs. GREEN. Would the gentleman yield?

Mr. NICHOLSON. Yes.

Mrs. GREEN. I would agree with a great deal of the feeling on the part of the gentleman from Massachusetts. I do think we need to evaluate our school program. I am concerned about some of the courses that I hear are offered.

I heard a new one yesterday at this conference. They said they not only had a credit for badminton, but also one credit for rest. That was new.

On the other hand I think that all is not as black as it seems.

I have a son who is a sophmore in high school this year. He is taking biology, Latin, algebra, geometry, and English. I am very well satisfied with the kind of courses he is getting. I am sure that this could be multiplied by millions across the country.

I also agree with Mr. Richardson that we need to spend our time on looking at the places where we have deficiencies in the program, and then go from there and decide how we are going to correct those.

The one thing that does not seem to be much in the discussion is the role of the teacher. I do not know how much thought, Mr. Commissioner, has been given to this, but this, to me, is one of the real problems in our educational program, the lack of good teachers, where we are going to get them, how we are going to pay salaries that will compete with private industry, how we are going to keep them in the schools.

I think of the medical profession, and the doctor, who is the best qualified and the most capable is usually the doctor who is in most demand by the sick patient, the surgeon who performs the operation.

And in the legal profession the lawyer who is the most capable is the one who works directly on the case and with the client.

We get into the field of education and social work, and we find that as to the teacher who is the most capable, and in my opinion, the one who should stay with the students, the only way we can keep that person in the educational profession is to promote him to an administrative job, thereby removing him from the classroom where we so desperately need him with the youngsters.

I think that this is one of the problems that we somehow have got to work out, to make it financially attractive to the qualified teacher to stay in the classroom instead of being promoted to administrative work.

Then the certification, to me, is a problem. I am concerned about the number of education and psychology courses that are required of teachers who would really like to take topnotch courses in solid subject matter.

If we are going to offer solid subjects in high school we are going to have teachers who know the subject matter as well as the methods of teaching.

I wish also that some Federal attention could be given to working out certification on a reciprocal basis. In my own State I think it is the silliest rule that a college graduate from Missouri or Kansas can come into Oregon, a successful teacher, and he or she is put on an emergency basis until he or she has had Oregon law and history.

I think it also gives a wrong picture of the number of teachers that are qualified. I do not think that this should be the basis of cetrification.

If we could give more attention to the teacher—and I do not know how that could be done, and whether you are planning that in your studies, I think it would be very important.

Mr. DERTHICK. Mr. Chairman, may I say to Mr. Nicholson that as I hear Mrs. Green tell about her son's course, and I hear her describe and interpret her philosophy of education, I would say that while I cannot tell you who is to blame, though I did enumerate a number of sources of blame, I can tell you what would make things right in our schools overnight; if we had every parent with her understanding about education or conviction about it, we would have our school problem solved.

I say that with a great deal of sincerity and with a realization that everybody in this room knows that I speak the truth.

Mr. ELLIOTT. Might I also say, Mr. Commissioner, that her son might be entitled to a little credit for "rest."

I recognize the gentleman from California, Mr. Roosevelt.

Mr. ROOSEVELT. Thank you, Mr. Chairman.

Mr. Commissioner, I am interested particularly in your testimony at the bottom of page 7 and at the top of page 8, and in your remarks that I think you said to Mr. Landrum, that if we could see how well such a program of guidance was actually working, in certain of the better schools, we would have a great confidence in it, but the thing that worries me is, we should also see how badly it works in certain areas, and we certainly would not want to spend any money in considering the bad situation, where it is not being properly applied, and where it probably is not producing the results it should produce.

In view of the seemingly universally accepted principle that the Federal Government should not control curriculum, should interfere as little as possible, I presume here that the State educational agencies and the plans that they would propose would be primarily only for review, not to control them.

In other words, you would not say, "This plan, in our opinion, just does not do the job that ought to be done. We think you ought to take the plan that is practiced, let us say, in California."

I cannot help but feel that perhaps we would be better off if we would attack the problem first by making sure that we develop the best testing program as a sample, whichever State could do it. Then we could point the finger at them and say, "Have you got this best plan which the Federal Government has developed and spent time on developing, and can be recommended as the very best?" Or, if later ones are developed, adjust to it.

I do not think that we should immediately jump into the picture in supporting the situation before we know that the money will be spent for the very best program, or even a very good program.

Mr. DERTHICK. That is a natural concern, Mr. Roosevelt.

There are two things I would have to say in answer to that.

No. 1, when I study our program in detail, I find that much weight is given to State leadership. In other words, a substantial amount of this money will be available for this State to provide itself with the best competency.

Very few States have a full complement of top leadership in this field. We anticipate their plan will provide for that.

The next thing I would say is that in this country, in many States and in many local school systems, we have the pattern, we have the experience, and we have the know-how. In our relationships with the States I have no anticipation that the States will not draw upon this good experience we have, in setting up their program. I think they are professionally competent to do it with this assistance.

Mr. ROOSEVELT. Is it well enough correlated so that you think it would not be a part of the Department's job to try to standardize it as much as possible?

Mr. DERTHICK. You see, this thing that I am driving at is, instead of spelling out a lot of regulations in great detail that the Federal Government is going to impose on the States, we have a professional relationship in which they do, in many instances, come to us for advice. They do not have to take it, it is true, but they come in the spirit of trying to find the best answer.

If we are able to find the best answer in the country, they are quite ready to take it.

I believe that in this professional relationship we can exercise the leadership and guidance that will be quite acceptable to the States.

Mr. ROOSEVELT. In other words, you honestly believe that the State plans will reflect the work which I assume the Department will do, in trying to develop the best guidance program?

Mr. DERTHICK. As a matter of fact, we will be overwhelmed with demand for that kind of assistance. It would not be forced on them, but it will be available to them.

Mr. ROOSEVELT. Can I follow that? What would happen in the case of a State coming in and asking a grant-in-aid under this program, where you, from your knowledge, did not feel that it used either the best plan or was capable, or showed a willingness to go forward on a better program; would you still give it a grant-in-aid?

Mr. DERTHICK. It would be hard for me to conceive of a State having such an attitude, in view of my experience with the chief State school officers and other State educational leaders in the State, but, if the State plan met these minimum specifications, if we did not think it was as good as it ought to be, we would still need to make the grant. We would not expect that every State plan would be as superior as every other State plan. Out of 48 different States, there naturally would be some plans that were better than others. But, if it met these minimum qualifications, we would not and should not withhold the money.

Mr. ROOSEVELT. Do you think it would be reasonable to inquire in case something of that kind came up, or in case there was an imbalance between the best and worst, that that be set forth in the report of the Department to the Congress in the operation of this plan?

Mr. DERTHICK. I think we would have to be free to give Congress the facts.

Mr. ROOSEVELT. I do not want you to be free. I want you to be sure we get it.

Mr. DERTHICK. I think we would be obligated to give the facts.

Mr. ROOSEVELT. That is fine. Thank you very much. Thank you, Mr. Chairman.

Mr. ELLIOTT. The gentleman from New Jersey.

Mr. FRELINGHUYSEN. I am sure all of us have been absorbed in the testimony this morning. I have just a few questions with regard to the waste of talent to which the Commissioner referred.

You pointed out that in the fall of 1950 approximately one-third of high-school graduates entered college. You pointed out also that one-half of those who stood in the upper half of their classes did not go on to college, on a full-time basis. Further, one-third did not go to college at all.

I have two questions: One is that the charge has been leveled against this program that it would be class legislation; that it would be the development of the elite.

In view of the fact that equality of opportunity has been a cardinal principle, I wonder whether you care to comment on this charge, that this would be class legislation, and whether also, if you were successful either in reducing the total number who go to college or the total number of able high-school graduates, that is not going to aggravate the problems which the colleges are going to have in preparing adequate facilities to handle these new students?

Mr. DERTHICK. We have done a good deal of thinking in the area of both of your questions.

I think I shall ask Mr. Flynt to answer that.

Mr. FLYNT. With regard to creating the intellectual elite, I do not think, Mr. Frelinghuysen and Mr. Chairman, this is aimed in that direction, or would so rest. The principal purpose is to identify those able students who ought to make the contribution to the optimum they are not making. A great many students are so doing. Testimony in the case is that at least half in the top third of their class are not doing this.

We seek to stimulate them to the ultimate of their capacity. Certainly because of self-fulfilment, we believe an individual ought to be doing his best.

Mr. FRELINGHUYSEN. If we get more of the able students into college, does that mean less of the less-able get in, or do we just increase the facilities to handle both categories?

Mr. FLYNT. I will answer your second question.

I might say first that it is not to increase the total number of college students. This is to make sure that people who are now capable of sustaining a college program are encouraged to do so.

If we were attempting to increase enrollments in college beyond the current rate, I think then we would raise the question of the flooding of facilities.

We have a certain amount of selection in all higher education, more in private than in public institutions, but the answer we have been giving to it, as a country, in the last two generations has been to insure that we provide a program for all those capable of carrying on an education beyond high school.

We build high schools and land grant colleges for that purpose. We have been doing it for a hundred years.

I think the answer will be that we will meet the demands of all types, whether it be advanced technicians who work on television, or to produce a doctor or an engineer.

Mr. DERTHICK. I think, Mr. Frelinghuysen, we might introduce this idea, too, that our testing, guidance and counseling program will result in some young people not going to college who are now going, and who can find their best places of fulfilment in other areas of endeavor. I think a good guidance program will do that.

Mr. FRELINGHUYSEN. The attempt will be to divert those who presently go to college and to encourage by supplying motivation, which is lacking, or financial assistance, which is lacking, to get the more able ones in.

Mr. JOHN A. PERKINS. I think this will be a real contribution in this two-stage program that really faces higher education in this country. The program now is to get into college the greater proportion of those youngsters who have the ability, but who are not going.

However, we will have a problem in the years to come, within the next 5 years, owing to the high birthrate, when our colleges will be quite overwhelmed. Then this counseling and guidance may make quite as great a contribution in diverting away from college youngsters whose ability and interest should not be headed in those directions.

So, counseling will be available in both the present situation and the situation to come.

Mr. FRELINGHUYSEN. I have no further questions.

Mr. ELLIOTT. The gentleman from New York.

Mr. GWINN. If you leave this to the States to conduct these tests would you not have the same weaknesses and show up the same failure to do the job, or at least such a disparity in performance, that you would not get the results that you were looking for?

Mr. DERTHICK. That has not been the experience in places where these testing and guidance and counseling programs have been most effectively conducted.

Mr. GWINN. That is, the States are doing a pretty good job?

Mr. DERTHICK. Some individual school systems are, in certain States. But the trouble is that too many systems in too many States do not have these resources to do the job.

Mr. GWINN. They are gradually taking them on, are they not, just as they are taking on good textbooks?

Mr. DERTHICK. In years—but we feel the national interest will not permit the country to wait that long for it to happen in that way.

Mr. GWINN. What would be the attitude toward the regular publishers of these tests that are not in circulation, toward this Federal program?

Mr. DERTHICK. That will be a decision for the States. I do not know what the attitude of the publishers might be. It will be the business of the State to determine what testing programs they should use, and how they should be administered there.

Mr. GWINN. Do you not intend to make a contribution in the materials of these testing programs?

Mr. DERTHICK. We might act in an advisory capacity, but those decisions would come from the State.

Mr. GWINN. That is what particular test the State would use?

Mr. DERTHICK. We would not tell them what test to use.

Mr. GWINN. Whether they bought them from the World Book Co. or from Ginn Co.?

Mr. DERTHICK. Or designed their own test. That would strictly be a decision that the State would make.

Mr. GWINN. What are you going to do then, just provide more money?

Mr. DERTHICK. We are going to provide these grants, these funds, to aid the State in accomplishing the objectives.

Mr. GWINN. They have the money now. Many States have the money now. Why are they not doing a good job? Many of the States have the money. We have the same problem we had in classroom construction. Some are and some are not. Why give New York and Ohio and California money to stimulate them to do what they should do?

Mr. DERTHICK. The whole point is that we cannot wait years for these programs to become effective in all of the States. There are too many youngsters. The very fact that we are losing 200,000 youngsters from our top brackets in ability would indicate that we cannot wait.

Mr. GWINN. Do you think we are justified as a Federal Government under the Constitution to do this, as a measure of national defense? Is that the theory?

Mr. DERTHICK. We think that is clearly in the national interest to do this job.

Mr. GWINN. No; I mean national defense.

Mr. JOHN A. PERKINS. Mr. Chairman, and Dr. Derthick, may I respond to that?

The National Government, throughout its history, although not delegated any specific responsibility to take on an educational program for the United States, has felt that education is so important to the well-being of the country that it has never hesitated to stimulate, by land grants and grants of money, the education program, to bring it to a level and respond to the national interest.

For example, the land-grant State universities were brought into being at the very time when the agriculture of this country was burgeoning and needing a more scientific emphasis, and when the mechanical arts, as they were then called, engineering as we now speak of it, and technology as we now speak of it, were just beginning to play a significant part in our industry.

At the time of the First World War, when we were short of machinists, and farm labor needed to be stepped up, because of a manpower shortage, we entered upon the vocational educational program.

It is another juncture, it seems to us, in our society and in the advancement of this country, economically, defensewise and so on, which seems to suggest that we ought to enter now upon a Federal program which would stimulate the maximum use of our greatest natural resource, our youngsters.

It does bear directly upon our national security, to be directly responsive to your inquiry.

Just yesterday at Yale, and for the day before, we had a great number of scientists in this country brought together.

There seemed to be there the unanimous opinion that the national security of this country was directly related to our educational system, and its effectiveness and to the making of that system more effective.

Our National Government, it seems to me, cannot possibly, under

the circumstances stand idly by and do nothing to bring our educational system another step along the very significant road that it has come.

Mr. GWINN. I suppose that you could argue with some force that a particular State has its own very special interest, say in agriculture, and would not have the facility for knowing what its percent should be in terms of preparing these youngsters. Is that the line on which you have conceived of this, that you stimulate the States? I was brought up to believe that the States should stimulate the Federal Government—it is an agent of the State, really—to do its job for the State.

Maybe we are at a stage where the Federal Government, functioning in matters of national defense, which is its sole job, would have to turn around and do what we have not been accustomed to thinking of, and stimulate the States to give them more soldiers, or give them more mathematicians.

I think we have to have a fundamental reason for doing this, a constitutional reason for doing it, in order to relieve ourselves of the fear that you fellows down there may want to tell our kids what to think, like you tell the grownups, through your propaganda, what to think on these things.

Mr. DERTHICK. Mr. Chairman and Mr. Gwinn—I think Mr. Gwinn was not here yesterday morning early, when Secretary Folsom gave his testimony. That is, you came in a little after he gave this part.

I think in just about two sentences from the Secretary's testimony, we hit the issue that you are touching on, when he says:

> This is a national need. It is a problem which requires a national perspective and a nationwide effort. It would be unrealistic to expect each local school district in America to act to meet this national need, as fully and as promptly as today's circumstances require.

Then from the President's Committee on Scientists and Engineers, there is a letter to the President from Howard Bevis, the chairman. He says in part:

> America's response to the Soviet challenge must be the marshaling of our brainpower resources, in company with other nations of the free world, not only for mutual defense, but to meet the broader challenges of the scientific age we have entered.

I think that now it is pretty well recognized throughout all the world that education is the major instrumentality in a cold war, or a hot war, either.

It is from that viewpoint that we come in the national interest and for national security, advocating these measures, to strengthen critical points of need in our educational program, through stimulation of the States, but through and in full recognition of State control and administration of schools.

Mr. GWINN. How are you going to emphasize it without making too much emphasis on the need of mathematicians and scientists?

Mr. DERTHICK. You are anticipating just a little bit my testimony.

I treat that pretty thoroughly in my written testimony, a little later on.

I wonder if you would mind if I covered that later?

Mr. GWINN. All right.

Do you contemplate that these materials in the test, the persons that make up these questions for tests, will be affected by this program? Are you going to get these counselors and these experts in testing from other than the regular sources from which they now function?

Mr. DERTHICK. It is a question of State responsibility there. The State must exercise responsibility and leadership in training these people when they do not have trained people available, improving the training of those who are partially trained, or with regard to the testing, it is up to the State to decide whether they will contract with a State university, or some other institution of higher learning, with the facilities, or some testing agency, or design their own tests.

Mr. GWINN. What is the source of this particular kind of specialty, persons who are specialists in these fields of testing? Where do we get them?

Mr. DERTHICK. Let me ask the Assistant Commissioner for Higher Education, Mr. Blauch, to answer that.

Mr. BLAUCH. The testing people are trained in the universities, largely through the departments of psychology. They receive their initial training there, but afterward they may be working in various places, testing people.

The educational testing service at Princeton is a good example of one of the large testing organizations.

There are some States which, through their bureaus of educational research, provide a service of this type to the State or to the communities.

Mr. GWINN. This idea originated with our psychologists or our psychiatrists, to expand their field?

Mr. BLAUCH. The idea of educational testing has come about largely from the study of psychology.

Mr. GWINN. Is there a fair unanimity of opinion among the professionals, as well as the parents who have to do with these things, that this is good, that there is no question about it, that this sort of thing does what we hope it may do?

Mr. BLAUCH. I think that the demonstrated accomplishments of this program in all those—in those all too few systems, but still, nationwide, quite a number, where it is being successfully conducted, that the results obtained there don't leave doubts. It is not a matter of guesswork; this is an accomplished scientific achievement, this testing, guidance, and counseling program. It will work and it will do what we expect it to do.

Mr. GWINN. You still have this human factor, of course, in any guidance, whether the judgment of a person who advises a youngster is correct, the same as the psychiatrist's judgment may or may not be right.

Mr. DERTHICK. That is true, but the cumulative record contains many test results. It has the judgment of a number of teachers, along with the guidance counselor's opinion, who would come into the picture. You see, it is not some decision that is made at one sitting, but it may be a decision that is evolved over a period of 4 or 5 years.

Mr. GWINN. And the testing is done at the local level?

Mr. DERTHICK. Yes, sir.

Mr. GWINN. Always?

Mr. DERTHICK. Always at the local level. We think that is very important.

Mr. GWINN. Of course, it is all subject to the counteraction of fathers or mothers or friends, or whoever is advising the youngster.

Mr. DERTHICK. But the fathers and mothers are included in the process.

Mr. GWINN. They become a part of the test?

Mr. DERTHICK. They become a party to the counseling process.

Mr. GWINN. Well, that is good.

I will not interrupt further. I appreciate your answers, and they are very persuasive.

Mr. DERTHICK. Thank you, sir. They were good questions.

Mr. ELLIOTT. I thank the gentleman from New York, and I thank Dr. Derthick and Dr. Perkins and Mr. Richardson and Mr. Flynt and Dr. Ludington, Dr. Conrad, Dr. Sneed, and Dr. Blaugh for their very fine contributions here this morning at this hearing.

Dr. Derthick, you have scheduling problems and so do we. Next week is the birthday of a great American by the name of Abraham Lincoln.

Many members of his party will desire to be out of town to celebrate his birthday. I think that after Monday we are not going to have much chance to have many hearings next week.

Let me leave it by saying that we will arrange with your office a convenient time for you to complete your testimony.

Mr. DERTHICK. Thank you, very much.

Mr. ELLIOTT. We thank you all.

The committee will resume at 10 o'clock tomorrow morning, but Dr. Derthick will not be able to be with us because he has answered a call to testify before the Senate Committee in the morning.

Our witness for tomorrow is Dr. L. A. Dubridge, the president of the California Institute of Technology, of Pasadena, Calif.

Mr. RICHARDSON. Could we request, or would it be feasible to have Dr. Derthick's testimony, at such time as the printed record is compiled, appear consecutively, since he has completed part of his prepared statement?

Mr. ELLIOTT. Without objection, Dr. Derthick's testimony, when given, will appear immediately following the testimony he gave today, so as to keep it in proper order.

I want to say to you, Dr. Derthick, that I sincerely hope that we can have you back right away, because I have enjoyed very much your testimony and the fine answers that you and your associates and the members of your group have given to our questions.

I think this morning has been very well spent for the committee.

Mr. DERTHICK. Mr. Chairman, I want to speak for my associates and myself, and to say that it is always a real pleasure for us to appear before your committee.

Mr. ELLIOTT. Thank you so much.

(Editor's note: In order to keep continuity of the witness' statement, Mr. Derthick's testimony (resumed) of February 19, 1958, will follow this day's hearing.)

(Whereupon the committee recessed, to reconvene at 10 o'clock a. m., on Thursday, February 6, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

WEDNESDAY, FEBRUARY 19, 1958

HOUSE OF REPRESENTATIVES,
COMMITTEE ON EDUCATION AND LABOR,
SUBCOMMITTEE OF SPECIAL EDUCATION AND
SUBCOMMITTEE ON GENERAL EDUCATION,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10 a. m., in room 429, Old House Office Building, Hon. Carl Elliott presiding.

Present: Subcommittee on Special Education, Representatives Elliott (chairman), Green, McGovern, and Wainwright. Subcommittee on General Education, Representatives Bailey (chairman), Gwinn, Frelinghuysen, and Haskell.

Staff members present: Charles M. Ryan, general counsel; Kennedy W. Ward, assistant general counsel; Russell C. Derrickson, chief investigator; and Mary P. Allen, clerk (Subcommittee on Special Education).

Mr. ELLIOTT. The subcommittee will be in order.

We will proceed with the statement of the United States Commissioner of Education, Mr. Lawrence G. Derthick, who testified originally on February 5, and whose testimony had to be interrupted because of the necessity that he appear to testify according to a previous engagement before the Senate committee.

I will say again, Mr. Commissioner, we are happy to have you, and you may proceed in any manner you see fit.

STATEMENTS OF LAWRENCE G. DERTHICK, COMMISSIONER OF EDUCATION; ELLIOTT L. RICHARDSON, ASSISTANT SECRETARY (FOR LEGISLATION); LLOYD E. BLAUCH, ASSISTANT COMMISSIONER FOR HIGHER EDUCATION; MELVIN W. SNEED, DIRECTOR, LAWS AND LEGISLATION BRANCH; JOHN R. LUDINGTON, CHIEF, SECONDARY SCHOOLS, INSTRUCTION, ORGANIZATION, AND SERVICES BRANCH, DIVISION OF STATE AND LOCAL SCHOOL SYSTEMS; AND HERBERT S. CONRAD, DIRECTOR, RESEARCH AND STATISTICAL SERVICES BRANCH, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Mr. DERTHICK. Thank you, Mr. Chairman.

It is always good to be before your committee, and, as you observe, my colleagues are here again, including Assistant Secretary Richardson.

We have edited very sharply this testimony in order to save your time, and, yet, we think we are treating the essential facts, and we can give more time for questions perhaps.

However, I would like to ask that the complete testimony appear in the record.

Mr. ELLIOTT. Without objection, the testimony of the Commissioner, as set forth in the prepared statement, will appear in the record following his reading of the portions of it.

Mr. DERTHICK. If we may spend about 5 or 6 minutes on scholarships, we are proposing, Mr. Chairman, under the provisions of part B of title I of the bill, a program of undergraduate scholarships which we regard as a key element of the comprehensive three-part program of testing, counseling, and guidance and scholarship, each part of which is aimed to encourage a higher proportion of the ablest high school graduates to continue their education.

I have already discussed the first two parts which would further this purpose by promoting the early identification of ability and the improvement of counseling and guidance services.

Our broad objective is to reduce the loss of talent, potentially important to national security, caused when so many able young people drop out of school too early.

The proposal of a limited scholarship program fits into these provisions in two ways:

First, the opportunity for scholarships on a competitive basis in itself would create a strong incentive for able young people to stay in school, work harder in academic subjects, and to prepare for college.

Second, it would provide assurance that a lack of financial resources need not be the barrier to higher education for the most able boys and girls who have been stimulated to want to go to college by the testing, counseling and guidance provisions of the program.

We know, of course, Mr. Chairman, that your Subcommittee on Special Education for some months has been developing a very comprehensive record of testimony on the availability and need for student financial assistance.

It will be recalled that our Department has previously testified at length on this subject, and I assume that it would not be your wish that we repeat that testimony. However, since testifying before the subcommittee in August 1957, we have completed a number of special studies and have developed other supplementary information which I should like with your permission to submit for insertion at an appropriate place in the record.

Mr. ELLIOTT. Without objection, the material to which the Commissioner refers will be inserted in the record at the points indicated by him.

(The material referred to follows:)

SUPPLEMENTAL STATEMENT OF LAWRENCE G. DERTHICK, COMMISSIONER OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

STUDIES OF NEED FOR FINANCIAL ASSISTANCE BY SUPERIOR HIGH-SCHOOL GRADUATES

Numerous studies have been conducted by public and private agencies and organizations and by responsible and experienced individuals which indicate the scope and extent of the financial needs of high-school students desiring to attain a college education.

Surveys conducted under the auspices of the National Science Foundation, Kansas State Teachers College (Emporia), the University of Minnesota, Hunter

College, the State University of New York, Utah State Department of Education, and under cooperative research agreements with the Office of Education, the Arkansas Southern State College, Indiana University, and the University of Wisconsin provide a valid body of data and criteria which can be utilized to distinguish the financial needs of high-school students from other factors which tend to discourage college attendance, such as lack of personal and family motivation and positive community influences.

In attempting to estimate the size of the potential group not now entering college who would be available for scholarship assistance, it is necessary not only to recognize the economic, professional, and cultural factors in the adolescent population but also to determine to what extent lack of financial resources is the determining factor. Fortunately, there has developed over the years a considerable volume of research data dealing with this problem.

A number of studies have been made of the college-going habits of Minnesota public-high-school graduates. In 1945, Keller reported that two-fifths of the seniors in the top 30 percent of achievement entered college. More recently in his study, After High School—What?, published in 1954, Ralph Berdie indicated that although the situation had shown some improvement, still one-third of the exceptionally superior high-school seniors had no plans to enter college. A year later in his followup survey he found that only 76 percent of the seniors indicating college plans had actually enrolled in college.

Prof. Alex A. Daughtry of Kansas State Teachers College at Emporia, made a similar study of approximately 5,400 Kansas public-high-school graduates (1955). Defining superior ability as the top third in achievement and intelligence, he reported that 1,800 seniors or 34 percent of the total group failed in the following autumn to enroll in the institutions of higher education. A comparable study of the superior high-school graduates of 1956 revealed a similar situation with an almost identical figure of 35 percent who failed to enter college.

A study of a group of high-ability graduates of three New York City high schools was recently completed. This report was made by Evelyn Mason and Jane Frydman of Hunter College, and was limited to 340 superior graduates in June 1955 (I. Q.'s over 117). Its findings are of considerable interest because of the substantial provision for higher education facilities at modest fees provided by the New York City municipal colleges.

A followup study 1 year later of these superior students indicated that 75 percent had enrolled in college as full-time students and another 9 percent had enrolled on a part-time basis. Despite ready access to "low cost" higher-education facilities, one-sixth or 55 or these superior graduates failed to enroll in any higher institution. Moreover, in an analysis of the reasons why these graduates had not enrolled or had dropped out during the first year of their college work, two-fifths reported that financial assistance would have enabled them to attend college on a full-time basis.

A report of an investigation of a special group of 300 high-achievement public secondary-school graduates in the State of Utah was presented by David R. Dixon at the subcommittee hearings at Salt Lake City, November 1, 1957. It is of special interest since Utah surpasses all other States in the percentage of people of high-school age (14–17 years) enrolled in high school and similarly in the percentage of college-age youth (18–21 years) enrolled in college. This study was confined to members of the top quarter of the June 1957 graduating classes of 25 Utah public high schools located 25 miles or more distant from a university or junior college.

By means of questionnaires and interviews with students, parents, and principals, it was ascertained that 83 percent of this superior group had enrolled in college. Of these, however, 30 percent anticipated financial difficulty which might force them to withdraw prior to graduation. Of the small group not enrolled in college, almost three-fifths indicated that they would attend if granted financial assistance. Dixon concluded that a suitable program of assistance would enable the institutions to attract and hold in college about 93 percent of this top quarter group of high-school graduates.

The most complete and significant national study concerning the problem of lack of college attendance by high-ability secondary-school studies was made by Charles C. Cole, Jr., assistant dean, Columbia College, Columbia University, under a grant from the National Science Foundation to the Educational Testing Service, Princeton, N. J. It was based upon the returns of a comprehensive questionnaire from approximately 10,000 seniors in 478 representative high schools in the spring of 1955. It was published in 1956 by the College Entrance Examina-

tion Board under the title, "Encouraging Scientific Talent: A Study of America's Able Students Who Are Lost to College and Ways of Attracting Them to College and Science Careers."

Based upon the Office of Education's estimate of 1,265,000 public high-school seniors (1954–55), and defining the superior students as those in the top 30 percent of intellectual ability, Cole estimated the total number of such able high-school seniors at 365,000. Of this group, 163,000 (45 percent) indicated their intention to enter college in the following autumn while another 95,000 or 26 percent said they planned to enter college later. Almost one-half of these superior seniors who did not plan to enter college indicated that the financial barrier was an important factor in their decision. Making provision for seniors enrolled in nonpublic secondary schools, Cole concluded that the number of high-ability seniors who do not enter college and who presumably are in need of financial aid if they are to be salvaged for higher education at approximately 60,000 to 100,000 per year.

The projection on a national basis of the group of high-ability seniors who indicated no interest in entering college, presumably even with scholarship offers, was estimated at another 100,000. Mr. Cole closed this section of his study with the following significant statement:

"Despite the increased interest in the bachelor of arts degree, higher education is still losing up to one-half of the top 30 percent or so of the Nation's high-school seniors. Each year, apparently, between 60,000 and 100,000 highly able secondary-school graduates with aptitude and interest for college failed to continue their education for financial reasons. Another group of similar size and ability lack the interest or motivation for college. This is a serious waste of intellectual resources which should not be overshadowed by the rising tide of college enrollments."

It is this group of superior high-school graduates whose families lack adequate financial resources which constitutes the pool of superior ability from which to train the larger numbers of engineers, teachers, scientists, researchers, doctors, and intellectual leaders which the country desperately needs.

In the spring of 1955, the Educational Testing Service, under a grant from the National Science Foundation, conducted a supplementary study of the college and vocational plans of 10,000 seniors in the top 30 percent in academic aptitude. The results of this study were published in August 1956 under the title, "Background Factors and College-Going Plans Among High-Aptitude High School Seniors."

Of this high-ability group of seniors, 80 percent of the boys and 70 percent of the girls reported that they would like to attend college. The other group of students, those who originally expressed a lack of interest in college, were asked if they would go if they had a scholarship. Four-fifths indicated that they would probably, and in some cases would certainly, desire to go to college. Apparently the substantial majority of the superior seniors who reported that they did not plan to go to college, indicated that they would plan to enter college if given scholarship assistance.

This report closed with the two following important conclusions:

"The fact that a very large number of able students without college plans would be willing to go to college if given a scholarship surely indicates that many students do not have college plans simply because they have never been able to view college as being a reasonable prospect. * * * Given a way to pay their expenses their plans apparently would readily change; given the assurance early in their school career that college is financially attainable, they might include in their courses the science, mathematics, and English needed to make it a reality * * *.

"In the salvage of cases such as these, a large-scale scholarship program, combined with better counseling in the junior and senior high schools, could most effectively increase the proportion of able students going to college. The existence of such a scholarship program would make it possible for high-school counselors to demonstrate to the 'no interest' student that college is, in fact, a real possibility. Even though many students who earlier expected to require such scholarship support later found independent resources, the scholarship program would have served a very useful purpose by encouraging students to plan for college."

AVAILABILITY OF STUDENT FINANCIAL ASSISTANCE IN INSTITUTIONS OF HIGHER EDUCATION

The Division of Higher Education of the Office of Education is currently engaged in a national study of institutional financial aid to college students. The number of undergraduate students aided and the total volume of student financial assistance of the several different types for the academic year 1955–56 are presented in table 1. Complete results of this study were presented to the Subcommittee on Special Education under date of August 15, 1957.

TABLE 1.—*Institutional financial aid for undergraduate college students, 1955–56*

Type of financial aid	Number of students	Amount
Scholarship grants	237,370	$65,736,950
Loans	77,107	12,463,182
Employment	288,479	65,931,915

Source: Wilkins, Theresa Birch. Financial Aid for College Students: Undergraduate. Department of Health, Education, and Welfare, Office of Education, Bulletin 1957, No. 18.

Although these data are based upon the returns of 1,560 colleges and universities which reported at least 1 of the 3 types of student aid, it is of more than passing interest that 190 other higher institutions indicated that they had no student aid available in any form. It is obvious that the number of college students aided and the total of such financial assistance granted directly by the institutions run into figures of considerable magnitude.

STATE PROGRAMS OF SCHOLARSHIPS

There is as yet no comprehensive study of State scholarship programs. Our present limited information is summarized from a variety of sources including legislative acts, data in the catalogs of State higher institutions, and officers of the State departments of education. Because of the failure to report all items in a consistent manner, the figures below are suggestive rather than complete. Scholarship programs are currently operated by 41 States and their supporting appropriations were approximately $14 million (1957–58). These figures do not include the payments of grants to professional and graduate-school students enrolled in institutions in other States under the three regional commissions of higher education.

Several of the States maintain limited scholarship programs for such special categories as veterans, children of veterans, Indians, students training for the health professions, prospective teachers, teachers of cerebral palsied children, and one State, New York, has a special program for engineering and science students. During the past academic year (1956–57), 4 States reported scholarship programs with annual appropriations in excess of $500,000 each and 4 other States maintain programs with appropriations between $250,000 and $500,000. In general, however, the number of scholarship awards under the several State programs are limited and the stipends for the most part are restricted to the amount of tuition costs and range from $30 to $600 per academic year.

The two States with the largest general (noncategorical) scholarship programs are New York and California, with a total combined cost last year of approximately 6½ million. During the past academic year, the New York State program provided 17,454 scholarships at an estimated cost of 6.2 million, while the California program which has only completed its first year of operation involved 600 scholarships and cost $232,415. In the fourth year of this program (1959–60) when it is fully implemented, it is estimated that 2,560 scholarships will be awarded and the total cost of these grants will be approximately $1,100,000.

Illinois has recently adopted a similar general scholarship program and has established a State scholarship commission by law and is now setting in place its administrative machinery. Next autumn (1958) its first group of scholarship recipients will enroll in college. The legislative appropriation for scholarships in the first year of this program is $600,000.

SCHOLARSHIP PROGRAMS OF BUSINESS, INDUSTRY, AND OTHER PRIVATE SOURCES

Another substantial volume of undergraduate scholarship assistance is that group of awards granted by a wide variety of business firms, corporations, labor unions, civic organizations, parent-teacher associations, women's clubs, and other organizations, which has grown rapidly in recent years. The estimate of the sponsored scholarship service of the Educational Testing Service for the current academic year (1957–58) for the principal volume of this noninstitutional scholarship assistance, that granted by business firms and corporations, placed the number of these grants at approximately 28,000 with a total value of approximately $18 million. The largest segment of this group of scholarships are those administered by the National Merit Scholarship Corp. This year approximately 60 business firms and corporations awarded about 1,400 merit scholarships and their total value was almost $900,000.

SIZE OF INSTITUTIONAL SCHOLARSHIPS

In the study of institutional student-aid resources conducted by the Office of Education, 1,332 colleges and universities submitted data with respect to the size of their annual scholarship grants. Although the total amount of institutional scholarship assistance reported by the colleges and universities is large in gross figures, the size of the scholarship grant to the median student was relatively modest. For the 431 publicly controlled higher institutions which submitted data, the grant to the median undergraduate student was $147, whereas in the case of his colleague in the privately controlled colleges and universities the median scholarship student received $275. Closer examination of the figures indicate that although approximately 21,000 students received scholarships in excess of $625 each, they constituted only 9.2 percent of the total group of scholarship students. At the other extreme, almost one-third of all scholarship winners received grants of less than $125.

TABLE 2.—*Distribution of undergraduate scholarship awards according to the size of the annual grant*

Size of annual grant	Publicly controlled	Privately controlled	Total	
			Number	Percent
Number of institutions	431	901	1,332	
$1,625 or more	68	712	780	0.3
$1,375–$1,624	79	989	1,068	.5
$1,125–$1,374	342	1,513	1,855	.8
$875–$1,124	798	4,412	5,210	2.3
$625–$874	1,284	10,824	12,108	5.3
$375–$624	5,996	28,732	34,728	15.2
$125–$374	35,819	63,906	99,725	43.8
Less than $125	38,172	34,263	72,435	31.8
Total	82,558	145,351	227,909	100.0
Medians [1]	$147	$275	$229	

[1] The median which is the middle figure which divides the institutions in two equal groups; one-half paying larger scholarship grants and the other half paying less has been utilized rather than the average, since it is not influenced to the same degree by the small number of grants at the extremes of the range.

Source: Department of Health, Education, and Welfare, Office of Education, Preliminary report of student-aid project, December 1957.

FAMILY INCOME

Recent family-income data are indicative of the ability of families to assist in underwriting the cost of college attendance of a son or daughter. Table 3 presents a comparative summary of family income after Federal income taxes, by fifths, for the years 1950 and 1954.

TABLE 3.—*Average family personal income after payment of Federal income tax for fifths of consumer units; 1950 and 1954*

Fifths of consumer units	Mean income after Federal income tax		Increase in personal after-tax income	
	1950 [1]	1954 [2]	Amount	Percent
All fifths of consumer units combined	$4,086	$4,833	$747	18
Highest	8,881	10,323	1,442	16
4th	4,688	5,492	804	17
3d	3,442	4,173	731	21
2d	2,359	2,901	542	23
Lowest	1,061	1,278	217	20

[1] U. S. Department of Commerce, Income Distribution in the United States, 1944–50; p. 85.
[2] Goldsmith, Selma F. Income Distribution in the United States, 1952–55, Survey of Current Business, vol. 36: 9–16 (June 1956).

It will be noted that family income after taxes in the fourth and highest fifth income groups has increased at a somewhat lower rate than incomes in the lower levels. It is from the fourth and highest fifths of income groupings that the greatest number of college students now come. It will be readily seen that, although the percentage increase in income from the lower three-fifths is about 20 percent, the mean income of these groups ranged from $1,278 to $4,173. Substantial student assistance funds will be necessary to attract into college the superior high-school graduates from families in these lower-income groups. The Department's proposed scholarship plan is designed to assist precisely this group of superior needy young people.

Further evidence concerning the ability of families to contribute to the college-going costs of family members is available from the 1955 income data. In that year approximately one-half of all family units had an annual income of less than $5,000; and, of these, 4 million families, or 9 percent of the total, had incomes of less than $2,000. It requires no extended calculations to establish the fact that these families could contribute only a limited amount toward the maintenance of a son or daughter in college.

INCREASE IN CHARGES FOR TUITION AND REQUIRED FEES

An important consideration in dealing with the problem of student financial assistance is the trend toward the increase of tuition and required fees to offset the rising operating costs which confront the colleges and universities. In this connection, it should be noted that the two groups of higher institutions, public and private, rely upon student-tuition receipts in varying degrees. For the academic year 1953–54, the most recent year for which complete and comparable institutional data are available, the income from student fees of the privately controlled higher institutions constituted approximately 50 percent of the total educational and general expenditures (except expenditures for organized research). In the case of the publicly controlled colleges and universities the comparable ratio was 14 percent.

Some indication of the size of annual tuition and required fee charges in the several types of higher institutions and the increases between 1949–50 and the current academic year (1957–58) is suggested by the data in table 4.

TABLE 4.—*Comparison of the average annual tuition and required fees of 196 representative colleges and universities, 1949–50 and 1957–58*

Type of institution	Number of institutions	Average tuition and required fees		Increase	
		1949-50 [1]	1957-58 [2]	Amount	Percent
All institutions	196	$249	$388	$139	56
Publicly controlled	120	112	168	56	50
Privately controlled	76	465	736	271	58
Publicly controlled:					
Universities	69	138	212	74	54
Liberal arts colleges	19	80	105	25	31
Teachers' colleges	17	89	143	54	61
Technological schools	4	142	171	29	20
Junior colleges	10	18	25	7	39
Privately controlled:					
Universities	57	457	732	275	60
Liberal arts colleges	14	439	675	236	54
Technological schools	5	626	962	336	54

[1] Conrad, Herbert S. and Hollis, E. V. Trends in Tuition Charges and Fees, Annals of the Academy of Political and Social Science, vol. 301: 148–64 (September 1955).
[2] Preliminary report, Division of Higher Education, Department of Health, Education, and Welfare, January 1958.

Although the percentages of increase for the 2 types of institutions were fairly similar, 50 percent in the case of the public institutions and 58 percent in the case of the private institutions, there was a marked difference in the average tuition charge of the 2 groups of institutions. In the case of the publicly controlled institutions, the average tuition and required fees this year is $168 in contrast to the average charge of $736 in the case of the privately controlled institutions. During the 8-year period, the average public college increased its tuition charge $56 while the average private institution raised its tuition fees by $271. The comparison of tuition charges for the several different types of institutions is also presented.

It is evident that the end of tuition increases is not yet in sight. Already increased tuition charges for the next academic year (1958–59) have been announced by such well-known institutions as Amherst, Barnard, Columbia, Cornell, Harvard, Massachusetts Institute of Technology, Mount Holyoke, Oberlin, Radcliffe, Rochester, Stanford, Trinity (Conn.), Tufts, Wellesley, Wesleyan, and Williams. However, in fairness to these fine colleges and universities, it must be granted that under present conditions such increases are apparently necessary to meet higher operating costs and for increased salaries of their teaching staffs.

BASIC INSTITUTIONAL AND TOTAL COSTS

Although tuition and required fees are already high and have increased in recent years, they still constitute only a part of the costs which confront college students and their parents. A better comparison of the basic institutional costs (tuition, required fees, board and room in institutional facilities) for students attending college away from home is presented in table 5. Considering both publicly controlled and privately controlled higher institutions as a single group, it is noted that in 389 or one-third of 1,168 institutions which supplied data, the basic institutional charge for tuition, board and room was in excess of $1,000. At the other extreme there were 25 colleges and universities (18 public and 7 private institutions), in which the basic institutional cost was less than $400.

TABLE 5.—*Comparison of the annual costs of tuition and required fees and board and room charges, 1955–56*

Annual tuition and required fees and board and room charges	Publicly controlled institutions	Privately controlled institutions	Total
$2,000 or more		12	12
$1,800 to $1,999		17	17
$1,600 to $1,799		42	42
$1,400 to $1,599		74	74
$1,200 to $1,399	1	95	96
$1,000 to $1,199	5	143	148
$800 to $999	33	193	226
$600 to $799	133	160	293
$400 to $599	160	75	235
Less than $400	18	7	25
Total	350	818	1,168
Median	$595	$971	$826

Source: Department of Health, Education, and Welfare, Preliminary Report of Student Aid Project, December 1957.

Although the median annual cost of tuition, board, and room in both types of colleges and universities is $826, there is a substantial difference in the median institutional cost of the public and private higher institutions. In the case of the public colleges, it was $595 while for the student in the private institution, the median basic institutional charge was $971 per year. Caution must be exercised in the interpretation of these median figures since they are for the number of institutions rather than for corresponding student enrollments.

Thus far, our consideration of institutional costs has dealt only with the basic institutional costs—tuition, required fees, board, and room. These costs, however, are but a portion of the total costs of maintaining a college student as the parents of students enrolled in a college or university will readily testify.

The Office of Education has recently published a comprehensive study of these costs. E. V. Hollis, of the Division of Higher Education, Office of Education, directed this study and prepared the report, Costs of Attending College, which was published in October 1957 as bulletin No. 9. It deals with the cost data for the academic year 1952–53 of a representative sample of 15,300 students enrolled in 110 colleges and universities. The study includes living costs, such as clothes, room, board, transportation, recreation, and educational costs such as tuition, fees, books, instructional supplies and equipment. The median total annual cost per student was $1,219 and the range in cost of the middle 50 percent of all students was from $815 to $1,708. The median cost of the expenditures of men students was $1,278, while the comparable figure for women was somewhat lower, $1,093.

The average annual expenditure for students residing in college-operated dormitories, according to the type of higher institution attended, are summarized in the following tabulation:

Type	Publicly controlled	Privately controlled
Universities	$1,297	$1,907
Technological institutions	1,331	1,714
Liberal arts colleges	922	1,557
Teachers colleges	993	
Junior colleges	1,113	1,972

It is interesting and significant to note that the students' families contributed 41 percent of their expenditures, 29 percent came from students' savings, and the students earned 17 percent after entering college. Scholarship grants accounted for 5 percent of the cost and the educational benefits of the veterans' GI bill, and the vocational rehabilitation program accounted for another 5 percent. Two thirds of the men students worked and earned an average of $486 per year, while half of the women students worked and averaged $295 per year toward their college costs. It will probably be of considerable interest to members of the committee to know that only 10 percent of the men students and 8 percent of the women students in this study were from families with annual incomes of less than $3,000.

QUALIFIED STUDENTS WHO ARE NOT AWARDED SCHOLARSHIPS BECAUSE OF INADEQUATE INSTITUTIONAL FUNDS

A partial measure of the unmet need for additional scholarship assistance is afforded by another Office of Education study now nearing completion. Of the 1,562 colleges and universities which supplied data concerning their student aid resources, almost one-half (718) provided estimates of the number of qualified applicants who were not awarded scholarships because the institutions lacked adequate funds. Of this group of institutions, 270 were publicly controlled and 448 were privately controlled.

According to the estimates of these institutions, they were unable to grant scholarships to approximately 70,500 students. A detailed analysis in terms of types of higher institutions and the number of students involved in the seven different types of colleges and universities is set forth in table 6.

TABLE 6.—*Estimated number of qualified undergraduate students who were not awarded scholarships because the colleges lacked adequate funds*

Type of institution	Number of qualified applicants		
	Public	Private	Total
Universities	16,818	14,322	31,140
Liberal arts colleges	3,456	21,477	24,933
Teachers colleges	6,035	247	6,282
Technological schools	835	1,978	2,813
Theological schools		596	596
Other professional schools	131	803	934
Junior colleges	2,132	1,663	3,795
Total	29,407	41,086	70,493

It is recognized, of course, that the number of students, particularly those planning to enter college for the first time, probably submitted applications for financial assistance to more than one college or university. Approximately $16 million of additional institutional scholarship money would have been necessary to fulfill requests regarded as worthy of favorable consideration by college authorities. This amount is based upon the assumption that the 718 colleges and universities which supplied these data were representative of all higher institutions, that each applicant submitted an average of 2.4 scholarship applications (college scholarship service estimate), and the further assumption that this group of applicants for financial assistance would have received scholarship grants of approximately the same magnitude as the successful scholarship holders.

Mr. DERTHICK. Thank you.

Our legislative proposal would authorize the appropriation of $7,500,000 for undergraduate scholarships for the first year of the program, and a like amount would be made available for new scholarships for each of 3 additional years. It is proposed that recipients of scholarships continue to receive stipends for a maximum of 4 years.

Based upon the assumption that the stipends will average $750 annually, it is expected that the sums recommended will provide for 10,000 new scholarships each year reaching a total of 40,000 in the fourth year of operation.

We have given serious consideration to the determination of what should constitute a reasonable Federal effort in this area.

The number of scholarships proposed will, we believe, provide a sufficient reward to high-school students who have been motivated to attend college and which, when added to institutional, State, and other financial aid available to students, will assist in making a major contribution to the drawing into college of large numbers of worthy

young people who cannot for financial reasons anticipate college attendance.

On the other hand, we believe the program is not so large as to discourage further scholarship assistance by institutions, States, and private donors. Nor do we believe that it will constitute an excuse for any withdrawal or diminution of existing scholarship programs.

Mr. Chairman, that is all that we thought we would present in formal testimony on scholarships.

I realize that you and your committee have studied this problem extensively and you may not have any further question at this time. But, before we go into the next part of the testimony, I thought I might pause to inquire.

Mr. ELLIOTT. The gentleman from South Dakota.

Mr. MCGOVERN. I will hold my questions for the time being, Mr. Chairman.

Mr. ELLIOTT. You may proceed then, Mr. Commissioner.

Mr. DERTHICK. All right, sir.

We are going next into the part of the testimony concerning grants to States for strengthening of science or mathematics instruction in the public schools.

As a preface to our testimony, at this point, Mr. Chairman, it scarcely needs to be said that we have entered a new era, an era unfolding as a result of new knowledge of the universe and the continued development of new sources of energy. In many respects what recently was in the future, as conceived in the minds of men, is already here. We have been startled by recent developments and the accelerated pace with which the doors to nature's secrets are being opened.

The relative recency of the entrance of the laboratory sciences into the curriculum undoubtedly is one factor limiting the character and degree of science offerings in the schools. Many of our schools never have had suitable laboratory facilities, and in school after school the few science courses that are taught are often of a very inadequate nature, with instruction by teachers with less than desirable qualifications for the task. In recent years even the more favored schools have suffered sharp limitations on their science programs, as we shall show. These and other conditions have contributed to a critical imbalance in the curriculum, instruction, and student enrollment.

The proposed legislation is designed to encourage State and local school systems to correct the imbalance in education, by strengthening the sciences and mathematics, which have suffered over the years. This emphasis is needed not only to enlarge our supply of scientists but to provide those students now in our schools—our future leaders—with a general understanding of these essential ingredients of the space age, so that they can comprehend the future promises, as well as the perils, of the age in which they live and make intelligent decisions each step of the way.

Today most of the States do not have the leadership needed to promote the necessary modernization and upgrading of instruction in mathematics and science.

Resulting in part from lack of personnel, most of the States have not developed modern mathematics and science courses of study and teachers' guides.

It is essential, we believe, that steps be taken to encourage the States promptly to incorporate new knowledge, new concepts and improved teaching procedures in their programs. Immediate attention should be given to extending the depth and breadth of learning opportunities and to revising elementary, secondary and collegiate sequences of study, with a view to discarding obsolete content and adding the new.

In this connection, we invite your attention to the conclusion of Mr. Elbert P. Little, executive director of the physical science study committee:

> The teaching of science has changed and changed substantially, in the half century, both in content and in technique. But on the whole, the changes have consisted in additions to the structure that existed 50 years ago, or in alterations to the existing structure. Lately there have been repeated intimations that this piecemeal reconstruction has long since failed in its purposes; that a new structure is now necessary; and that it must be designed from the ground up.
>
> The problem is seen most clearly in the secondary-school physics syllabus. Structurally it goes back to the early part of the century, and despite the adjustments of the past five decades it represents quite clearly the state out of which the science was even then beginning to pass (p. 316, The Science Teacher, November 1957).

A number of factors contribute to the difficulties which school systems face in developing adequate programs of mathematics and science. However, let us consider the problem of the teacher. Certainly all of us would agree this is a prime factor. It applies in other fields, of course. But the shortage is considerably more severe in the fields of mathematics and science. Moreover, the preparation of those presently engaged in these fields is less adequate than in other subjects.

For example, one study of mathematics in California schools, July 1956, indicated that nearly one-third of the mathematics teachers in high-school departments did not have a college major or even a minor in mathematics. And that is one of our most-favored States, of course.

Nearly 25 percent of the secondary-school mathematics teachers in the District of Columbia are teaching without a major in the field. A recent report on the teaching of science in Illinois cites a similar problem. The report further points out that the higher salaries offered to college graduates in science by Federal and State agencies and by industry are a major factor in preventing the entrance of such trained personnel into the teaching profession.

There has been an alarming drop in the number of science teachers trained annually. In 1950, 9,096 qualified science teachers graduated from our colleges. In 1956 only 4,320 were graduated, a decrease of more than 50 percent. A slight improvement over the latter figure was noted in 1957 when the number increased to around 5,000. Moreover, for a variety of reasons, of those graduates prepared to teach science only about 60 our of every 100 actually accept teaching positions. In contrast, more than 80 percent of those who prepare for elementary school teaching enter teaching immediately.

Added to the teacher problem is the poor condition of laboratories and equipment. Since laboratory equipment, particularly in advanced courses, constitutes a major expense, many schools have resorted to nonlaboratory methods of teaching. As a matter of fact, it is not uncommon to find a complete absence of laboratory facilities in the required general science and biology courses, to say

nothing of those sciences requiring more complicated and expensive laboratory equipment.

For example, a recent report from one State—West Virginia—contains the following highly significant statement:

> Biology has been required by statute in our public high schools for at least 25 years, yet the facilities for teaching it are significantly lower than for any other high school subject covered by this survey. It would seem that, since every high school graduate, in reality almost every student who completes the 10th grade, has one unit of biology, more attention need be given to equipping laboratories. It is difficult to draw any conclusion other than that this important life science is presented almost wholly as a read-and-remember textbook course. (A Survey of The Educational Programs of the West Virginia Public Schools, Legislative Interim Committee, State of West Virginia, 1957.)

A study of the physical condition of high school science departments in another State—North Carolina—in 1956–57 rated 58 percent of the 619 departments in fair or poor condition.

Mr. G. R. Boyd of the Troy State College, in an article entitled "The South Needs Science Teachers and Equipment," Alabama School Journal, October 1957, writes as follows:

> It is difficult to obtain accurate information about the science laboratory equipment in our southern high schools, but casual observation reveals that few schools have more than a fraction of the science equipment needed for a well-rounded program of science.

To stimulate immediate improvement in order to overcome this critical situation, the bill would authorize the appropriation of up to $150 million annually for grants to the States to assist local educational agencies to expand and improve science or mathematics instruction in public secondary schools.

These funds, depending upon determination made by the States in their own State plans, may be used for (1) employment of additional qualified science or mathematics teachers, (2) increasing the salaries of science or mathematics teachers to make their pay more competitive, or to reflect additional work such as teaching in summer sessions, curriculum revision responsibility, and the like, (3) or for science or mathematics laboratory and related special equipment and minor remodeling of space used for such equipment, or (4) otherwise expanding or improving science or mathematics teaching in public secondary schools.

When yesterday I had the privilege of sitting in with your committee and hearing the testimony, I was impressed with the fact that our proposal would support the recommendations made here yesterday, provided the State and local school systems chose to make part of the investment that way. Not only would it support the equipment that was talked about if the State and local boards chose, but it could support these teacher seminars, because this money could be used to pay the teachers for the extra duty in the summer or otherwise.

Mr. ELLIOTT. Mr. Commissioner, do you have any figures or any general ideas as to what it would cost in an average high school to properly equip a laboratory?

Mr. DERTHICK. Yes, sir, Mr. Chairman; we do have some of those figures, and I might ask Dr. Ludington to give those. Would you like them at this time?

Mr. ELLIOTT. Yes.

Mr. LUDINGTON. We have a copy of this material for the record, but I think at this point it might be well just to review some of the figures so that we might have them in our minds.

These figures, Mr. Chairman, come from a recent survey conducted by the equipment manufacturers of the costs of furnishing recent school installations, and these are their figures based upon average cost of the equipment installed in a general science laboratory. They estimate $6,000.

I think, in the case of Georgia, we had a report where they were spending an average of $5,000 per laboratory, for the basic equipment.

In Tennessee I think their basic estimate is $6,000. So this figure is pretty close.

Mr. ELLIOTT. In other words, we will say from $5,000 to $6,000 would buy the basic equipment?

Mr. LUDINGTON. Those are the items of furniture, the kinds of things that the architect usually specifies at the time the building is designed or planned. A general science laboratory would run $6,000; a biology laboratory, $6,700; and physics labs tend to run about $9,600; chemistry laboratories a little higher—$12,600.

In addition to those figures, we have various items of student apparatus and teacher demonstration equipment, chemicals and consumable supplies.

These figures for a general science laboratory run from about $1,200 to $4,300, depending upon the size and the desires of the school. A biology laboratory would run from about $3,200 to $8,200. A physics laboratory would run from $3,400 to $8,900; and a chemistry laboratory, $2,400 to $7,200.

The latter figures would be added to the initial figures for basic furniture.

I think, too, at this point it might be of interest to note that the market in recent years, as reported by one of these equipment manufacturers, has been such in the schools that they have not kept up their tools and dies, simply because the market in business, industry, and government was a better market, and the school market, being a dwindling one, has led to, I think, a situation that has forced the schools into a condition that normally we would not like at all.

Mr. DERTHICK. In order to encourage and assist the State departments of education to expand and improve their supervisory and leadership roles in the strengthening of science and mathematics instruction, appropriations would be authorized by the bill up to a maximum of $15 million annually for the duration of the program.

I am confident, Mr. Chairman, that the proposal we have recommended will enable the States and local communities to achieve significant improvements in the teaching of science and mathematics. I do not expect, of course, that everyone will agree with all elements of the proposal.

There are those who would question, for example, any special salary supplements for teachers of mathematics and science. Their reasoning has much merit with which I personally have a great deal of sympathy.

Other things being equal or in balance, shall I say, I would not make salary distinctions among good teachers of any grade or subject. Each good teacher is of paramount importance. But our national interest and national security are seriously at stake. We must take special measures to correct the imbalance, and, should the States and local school districts include in their plans some supplementation of salaries in the national interest, my hope is that simultaneously they would exert themselves vigorously to make appropriate adjustments in the salaries of others. Indeed, if precedent is a guide, this would be almost certain to happen in the course of developments.

In my judgment, this program is of momentous significance. In this connection, I am reminded of the statement Dr. James R. Killian made more than a year and a half ago in his testimony before a congressional committee. Dr. Killian expressed concern because we were becoming a Nation of mathematical illiterates in an age when mathematics is an essential ingredient for our very existence. The evidence since that testimony has only accentuated the merits of this reasoning.

I can tell you that Dr. Killian is one of the stanchest advocates of a balanced program in education. I know he would be among the first to urge that State and local boards and school administrators see to it that the balance is maintained.

With dedicated, well-trained teachers, an up-to-date curriculum, and laboratories up to the standard of both, science and mathematics would speedily attain their rightful stature in the secondary-school curriculum.

Mr. Chairman, we have finished that section, and you may want to raise some questions or have a discussion.

I do have an insert that I want to supply for the record at that point. It will give you additional statistical information.

Mr. ELLIOTT. Without objection, the insert will be made a part of the record at this point.

(The material referred to follows:)

Average cost of equipping high school science laboratories
(estimates based on 28 students)

[Includes laboratory counters, benches, cabinets, fume hoods, desks, etc., but does not include apparatus or instruments]

General science laboratory	$6,000
Biology laboratory	6,700
Physics laboratory	9,600
Chemistry laboratory	12,600
Preparation rooms (2)	2,900
Total	37,800

Apparatus and instruments

General science:		
Student apparatus	$1,600 to	$4,800
General class apparatus	350 to	1,400
Demonstration apparatus	525 to	1,575
Chemicals	75 to	180
Additional desirable apparatus	200 to	800
Total	1,245 to	4,335

Apparatus and instruments—Continued

Biology:			
Student apparatus	$1,600	to	$4,800
General class apparatus	680	to	1,360
Demonstration apparatus	440	to	880
Chemicals	75	to	200
Additional desirable apparatus	440	to	1,000
Total	1,245	to	4,335

In addition to the above figures for initial installation, it is estimated that an annual replacement figure of $1,000 per year for expendables for general science and biology should be added.

Physics:			
Student apparatus	$1,000	to	$2,000
General class apparatus	1,250	to	2,500
Demonstration apparatus	600	to	2,000
Chemicals	75	to	225
Additional desirable apparatus	550	to	2,200
Total	3,475	to	8,925

In addition to the above figures for initial installation, an annual replacement figure of $655 per year for expendables should be added.

Chemistry:			
Student apparatus	$600	to	$2,400
General class apparatus	900	to	2,100
Demonstration apparatus	350	to	950
Chemicals	200	to	750
Additional desirable apparatus	400	to	1,000
Total	2,450	to	7,200

In addition to the above figures for initial installation, an annual replacement figure of $3,000 per year for expendables should be added.

High School Graduation Requirements Established by State Departments of Education

(By Grace S. Wright, secondary education)

[Circular No. 455, revised January 1958, U. S. Department of Health, Education, and Welfare, Office of Education, Washington, D. C.]

When State departments of education were asked to report changes in their graduation requirements made since 1955 when Circular No. 455 was first issued, 32 States, including the District of Columbia (hereafter counted as a State), reported no changes, or minor changes in wording only. Seventeen States reported changes which involve (1) the total number of Carnegie units prescribed, (2) specific unit requirements, or (3) the addition or elimination of a legal requirement concerning instruction in a specified area, such as physical education, or a change in some other type of practice affecting graduation.

Viewed broadly, high-school graduation requirements at the State level have changed little since 1955. At that time the hypothetically "typical" State department of education required 3 or 4 units of English; 1, 2, or 3 units of social studies; 1 unit of science and 1 of mathematics, or none of either subject; and 1 to 4 years of instruction in health and physical education for which it might or might not allow a unit of credit. The "typical" State allowed for 8 or more units of electives within the total of 16 Carnegie units required for graduation.

The overall picture 2 years later is different only in that the "typical" State is more likely to require 1 unit of mathematics and 1 unit of science.

Wide differences among States have existed and continue to exist. The total number of units in specified subject areas ranges from 0 to 13; allowance for elective subjects ranges from all in States that stipulate no subjects which all

must take to a minimum of 5 in States with large numbers of specific requirements, as shown below:

Required subjects:	States	Elective subjects:	States
0 to 4 units	11	5 to 7 units	10
5 to 7½ units	11	7½ to 8½ units	15
8 to 9½ units	19	9 or more units	24
10 to 13 units	8		

Trends in State requirements

When a State-by-State count is taken, some changes are observable which may suggest trends.

(1) There seems to be a tendency to add to the total number of units required for graduation. The three States that changed their total of required units did so by increasing the number.

Units required grades 9 to 12	Number of States	
	1955	1957
None	3	3
15 to 15½	3	3
16	36	32
17 to 20	8	[1] 11

[1] Includes Georgia whose 18-unit requirement takes effect in 1961, and Utah whose total is inconclusive but is expected to reflect the increased requirements for the various subjects.

(2) Changes in English and social studies requirements represent more often increases than decreases. Three States increased their English requirement from 3 to 4 units; 1 State reduced its requirement from 4 to 3½ units. In social studies, 3 States increased their total requirement by one-half or 1 unit; 2 States reduced it by one-half or 1 unit.

(3) In mathematics and science all changes in requirements are additions or increases. Four States having no requirement in mathematics or science added 1 or 2 units in each area. Another State increased its requirement in science from 1 to 2 units, but modified the requirements by authorizing certain substitutions for 1 year of science. Still another State requiring a unit in both mathematics and science now requires that one or the other of these subjects must be taken for 2 units.

(4) A third State, Utah, has joined Minnesota and Pennsylvania in basing graduation requirements upon units earned in grades 10 to 12 only.

Subject areas of concern to State departments of education

The following summary table shows the number of States requiring instruction in basic subject areas:

Subject requirements of State departments of education—High-school grades 9–12 [1]

Subject	Number of States											
	Number of units										Other [2]	No requirement
	4	3½	3	2 or 3	2½	2	1½	1 or 2	1	½		
English	18	1	19								1	10
Social studies			9	1	3	17	4		9	1	2	3
Mathematics						2	1	1	27			18
Science						[3] 5		2	25			17
Health and/or physical education	1					3	1	1	15		10	18
Fine or practical arts						1			4			44

[1] Includes 9th grade requirements for Minnesota, Pennsylvania, and Utah, although these States count only units earned in grades 10–12 to compute graduation requirements.
[2] Instruction is required but units of credit are not specified.
[3] In 2 States practical arts, and in 1 State a foreign language may be substituted for 1 year of science.

Some States itemize one or more social studies courses as obligatory for all pupils and a few States do the same for the science course or courses. The most common course specifications are American history and government: 42 States list American history and 33 States specify American Government, civics, citizenship, or the Constitution.

Besides the units of instruction in basic subjects, several States have other prerequisites to high-school graduation. These are usually legal requirements. They include conservation of natural resources, 3 States; effects of alcoholic drinks and narcotics, 6 States; safety and driver education, 3 States. Other prerequisites mentioned by 1 or 2 States each are fire prevention, first aid and safety, flag education, manners and morals, and principles of agriculture.

In 7 States, the pupil must follow a program that will assure him 2 or 3 years' work in each of 2 or more fields. A requirement of 2 majors of 3 units each and 2 minors of 2 units each is typical.

On the following pages will be found a State-by-State listing of high-school graduation requirements.

State requirements for high school graduation

State, with total units required	Subject requirements	Required and elective units
Alabama, 16	English	4
	Social studies: citizenship and Alabama history 1; American history 1; economics ½; democracy ½.	3
	Mathematics	1
	General science (9th grade)	1
	Physical education, 4 years	1-2
	Electives	[5 or 6]
Arizona, 15	English	3
	Social studies: American history 1; civics ½ (which must include both the United States and Arizona constitutions, required by law); elective ½.	2
	Mathematics	1
	Science	1
	Electives	[8]
	A year of health and physical education with emphasis on health is recommended for each pupil, but not required.	
Arkansas, 16	English (speech and journalism may be substituted for 12th grade English).	4
	American history (required by law)	1
	Electives	[11]
	Physical education is required by law of all students.	
	1 major of 3 units and 3 minors of 2 units each are required.	
California, 19–24 [1]	By law and by rules and regulations of the State board of education, all pupils must receive instruction in the following:	
	English: Courses to promote the satisfactory mastery of oral and written English.	
	Constitution of the United States and American history including American institutions and ideals and principles of State and local government.	1½
	Physical education: An instructional period each day	4
	Driver education: A minimum of 30 class hours.	
	Manners and morals: All grades and all classes.	
	Alcohol and narcotics, fire prevention, 1st aid, public safety and accident prevention, conservation.	
	District requirements and electives	[13½–18½]
	Also established by the State board are requirements that students to be graduated must be of good character and citizenship; must satisfactorily complete the full curriculum prescribed; and must have earned the number of semester periods as established by the governing board of the district.	
	1 high school in every district is required to provide a course of study in line with the University of California's entrance requirements. The following program is required of all college-preparatory pupils: 3 units of English; 1½ units of United States history; 2 of mathematics; 2 of foreign language; 1 of laboratory science; 1 additional unit in either mathematics, science or foreign language; and 4 units of physical education.	
Colorado, 16	By statute, all public high school graduates must have received instruction in the Federal Constitution. This is the only requirement.	
	Electives	[16]
Connecticut	American history (required by State law)	1

[1] Total subject requirements are 190 to 240 semester periods. The average California high school requires at least 21 units or 210 semester periods for graduation, while practically no school will accept 19 units or 190 semester periods as fulfilling their graduation requirements.

State requirements for high school graduation—Continued

State, with total units required	Subject requirements	Required and elective units
Delaware, 16	English	4
	Social studies	2
	Electives	[10]
	Instruction in the Constitution of the United States and of Delaware is required by law for all pupils, as is instruction in physiology and hygiene, with special reference to the effects of alcoholic drinks, stimulants, and narcotics upon the human system. Health and physical education is required of all pupils insofar as the teaching force is adequate. Delaware issues 5 diplomas: Academic, scientific, commercial, vocational, and general. For each of these, except the general, the State department of public instruction requires pupils to complete additional required courses. The academic diploma, for example, calls for 2 units of Latin, 2 units of a 2d foreign language, 3 of mathematics, and 1 of science. The scientific diploma requires 2 units of foreign language, 2 of mathematics, and 2 of science. Beyond the 5 diplomas the State of Delaware issues a certificate of attendance, which is given to those children who, because of mental inability, are unable to satisfactorily complete high school level work. A certificate of attendance is issued only upon recommendation of the school psychologist, the local guidance counselor, the school principal, and with the approval of the parents. Beginning with graduates of 1958 a school district may exercise option through the State department to have the differentiated diplomas or to issue a single diploma showing graduation. In 1960 the single diploma will be the State-required diploma and the differential set will be discontinued.	
Florida, 20	English	3
	Social studies, including 1 unit of American history or American history and government.	2
	Mathematics	1
	Science	1
	Physical education	2
	Homemaking (for girls)	1
	Electives	[10 or 11]
	Required by law for all pupils is instruction in civil government, United States Constitution, history of Florida, conservation of natural resources, flag education, principles of agriculture, true effects of alcoholic liquors and narcotics, kindness to animals, and moral and spiritual values.	
Georgia, 16 now, to be raised to 18 in 1961.	English	3
	Social studies, including 1 unit in United States history and government as legally required.	3
	Biology (must include human biology)	1
	Mathematics	1
	Science or mathematics	1
	Electives	[7 now, 9 in 1961]
	1 year of health is required. This may be in whole or in part in the 8th grade, or in whole or in part in grades above the 8th. Physical education, 30 minutes per day is required by law. (Courses should be adapted to needs of handicapped as well as physically normal.)	
Idaho, 17	English and literature	3
	Social studies including 1 unit of United States history and ½ unit of U. S. Government.	1½
	Mathematics	1
	Science	1
	Health	½
	Physical education (not athletics)	½
	Electives	[9½]
Illinois, 16	English	3
	American history or American history and civics	1
	Physical education and health education	1
	Electives	[11]
	Pupils are required "to engage daily during the school day in courses of physical education and health instruction for such periods as are compatible with the optimum growth and development needs * * *." Special activities or modified courses must be provided for the handicapped. Instruction in the nature and effect of alcoholic drinks and narcotics is required for all 9th grade pupils. Instruction in traffic safety and driver education is required in at least 1 of the grades 9-12, equivalent to 1 class period a week.	

State requirements for high school graduation—Continued

State, with total units required	Subject requirements	Required and elective units
Indiana, 16	English	3
	Social studies: 1 unit of United States history and 1 unit of citizenship including 1 semester of U. S. Government.	2
	Mathematics	1
	Science	1
	Health and safety	½
	Physical education	½
	Electives	[8]
Iowa (16 units are recommended but not required.)	History and civics (required by law)	1
	Physical education and health instruction are required by law for all pupils for 50 minutes each week. Modified courses must be provided for physically or mentally handicapped pupils. The Department urges the use of more time than the law requires.	
	All pupils must receive instruction in physiology and hygiene, including the effects of alcohol and narcotics.	
Kansas, 17	Language arts	3
	Social studies, including 1 unit of American history, and ½ unit of government including Constitution of the United States.	2
	Science (It is recommended that this unit be in the upper 3 grades; and where general science is offered in the 9th grade, be in addition to it. 3 units of vocational home economics or vocational agriculture will meet this requirement.)	1
	Mathematics	1
	Health and physical education	1
	Electives	[9]
Kentucky, 16	English	3
	Social studies, including 1 unit of American history	2
	Mathematics	1
	Science	2
	Health and physical education	1
	Electives	[7]
Louisiana, 17 [2]	English I, II, and III	3
	Social studies: American history 1; civics 1	2
	Mathematics (If the minimum of 1½ is offered, the ½ must be senior or business arithmetic.).	1½ or 2
	Science (any 1 unit except preflight aeronautics)	1
	Physical education	1
	Electives	[8½ or 8]
	The 17 units offered shall be so selected as to constitute 3 majors, or 2 majors, and 2 minors. A major is 3 units, a minor 2 units.	
Maine, 16	English	4
	American history	1
	Electives	[11]
Maryland, 16 [3]	English	4
	Social studies, including 1 unit of United States history	3
	Mathematics	1
	Science	2
	Electives	[6]
	Several periods a week of health and physical education for all pupils in grades 9–12 are strongly recommended.	
	Maryland issues 4 diplomas: Academic, general, vocational, and commercial, with additional unit requirements for all except the general. For the academic diploma, an additional unit of mathematics is prescribed.	
Massachusetts, 15	American history and civics, including the United States Constitution, the Declaration of Independence, the Bill of Rights, and the Constitution and history of the Commonwealth.	1
	Electives	[14]
Michigan	Government (legislative requirement)	½
Minnesota, 12 [4]	English	3
	Social studies, including 1 unit of American history	2
	Electives from the fields of science, mathematics, foreign language, practical arts, and business education.	[3]
	Additional electives	[4]
	Legal requirements include instruction in health, physical education through the 10th grade, instruction in morals, alcohol, narcotics, Declaration of Independence and Constitution of the United States.	
Mississippi, 16	English	3
	American history	1
	Electives	[12]

[2] The 17 units must be completed during a minimum of 4 regular 9-month sessions of high-school enrollment.

[3] The State department of education asserts that while 16 units are the minimum required for graduation in general, pupils should present more than 16.

[4] Only the credits earned in senior secondary school are counted toward graduation. Constant subjects in the 9th grade include English, social studies, general science, health and physical education, and practical arts.

State requirements for high school graduation—Continued

State, with total units required	Subject requirements	Required and elective units
Missouri, 17	English	3
	Social studies, including personal, community, and State problems; problems of the Western Hemisphere, world problems and history; and American history and government.	3
	Mathematics	1
	Natural science	1
	Fine arts (art or music)	1
	Practical arts	1
	Physical education and health, minimum of 2 periods a week (4 years earning ¼ unit a year).	1
	Electives	[6]
Montana, 16	English	4
	Social studies: American history 1; American government ½	1½
	Mathematics (algebra and plane geometry are encouraged)	2
	Science: General, biological, or physical	1
	Electives	[7½]
Nebraska, 16	No required courses	
	Electives	[16]
	The State department of education recommends the following pattern of graduation requirements: English 4 units; social studies 4; mathematics 2; science 2; fine arts ½; practical arts 1; health, safety, and physical education 1.	
Nevada, 16	English	3
	Social studies, including 1 year of American history and American government (½ year of each as minimum requirement).	2
	Mathematics (or business arithmetic)	1
	Science (home economics or agriculture may be substituted)	1
	Physical education	1
	Electives	[8]
New Hampshire, 16	English	4
	Social studies, including United States history and government	2
	Mathematics	1
	Science	1
	Electives	[8]
New Jersey, 15½	Social studies, including 2 years of American history (legal requirement) and a year of community civics in 9th grade if it has not been taught earlier.	2 or 3
	Physical education, health, and safety (legal requirement, with 150 minutes a week for 4 years).	½
	Electives	[12½ or 11½]
New Mexico, 16	English	3
	Social studies, including a year of American history or American history and civics.	2
	Mathematics	1
	Laboratory science: Chemistry, physics, or biology (under certain circumstances vocational science may be substituted).	1
	Electives	[9]
	The State board has requested all school superintendents to use every means at their disposal for putting into effect September, 1957, a regular instructional program in physical education for all children grades 1 through 10. The minimum time allotment recommended is 300 minutes per week for high school.	
	Besides the major in English, the pupil must offer 2 majors or 3 minors or an equal combination of majors and minors.	
New York, 16	English	4
	Social studies, including a year of American history	3
	Science (9th grade)	1
	Health	½
	Electives	[7½]
	Physical education without credit is required for at least 2 school periods a week each semester.	
	Each pupil must follow a 3-year sequence in 1 of the following fields: Science, mathematics, foreign language, music, art, business subjects, practical and industrial arts, or vocational subjects.	
North Carolina, 16	English	4
	Social studies, including a year of American history	2
	Mathematics	1
	Science: Biology and 1 additional unit	2
	Physical education and health (9th grade)	1
	Electives	[6]
North Dakota, 16	English	3½
	Social studies: United States history 1; world history 1; problems of democracy 1.	3
	Mathematics	1

State requirements for high school graduation—Continued

State, with total units required	Subject requirements	Required and elective units
North Dakota, 16	Natural laboratory science (2 units of homemaking or vocational agriculture may be substituted for 1 unit of science).	2
	Physical education	1
	Electives	[5½]
	Safety and driver education is required.	
Ohio, 16	English	3
	Social studies, including 1 year of American history and government.	2
	Mathematics	1
	Science	1
	Health and physical education	1
	Electives	[8]
	Besides the major in English, each graduate must have 1 other major of 3 units and 2 minors of 2 units.	
Oklahoma, 16	English (1 unit of speech, 1 unit of journalism, or a combination of ½ unit of speech and ½ unit of journalism, or business English when taught by the English teacher may be substituted for English literature).	4
	American history	1
	Mathematics	1
	Laboratory science, chosen from general science, biology, physics, and chemistry.	1
	Electives	[9]
Oregon, 19	English	3
	Social studies: United States history and government 1; American problems 1.	2
	Mathematics	1
	Science	1
	Health and physical education	2
	Electives	[10]
Pennsylvania, 12 [5]	English	2
	Social studies, including 1 unit of American history and government	2
	Health and physical education, 3 years	1
	Electives	[8]
Rhode Island	Every high school pupil must receive instruction in the Constitution and government of Rhode Island and of the United States (required by law).	
South Carolina, 16 [6]	English (the 4th year should be set up in the light of individual needs)	4
	Social studies, including 1 unit of United States history which includes a careful study of the Constitution	2
	Mathematics	1
	Natural science	1
	Electives	[8]
	Besides English, a major of 3 units is required. A pupil must attend the school issuing the diploma for at least the semester immediately preceding his graduation.	
South Dakota, 16	English	3
	Social studies in grades 11 and 12, with not less than ½ unit each of American history and American government.	2
	Mathematics	1
	Laboratory science	1
	Electives	[9]
Tennessee, 16	English	4
	American history, including Tennessee and United States Constitutions.	1
	Mathematics (arithmetic, algebra, or applied math)	1
	Health and physical education	1
	Electives [7]	[9]
Texas, 16	All pupils who have entered the 9th grade before the beginning of the 1958–59 school year must earn:	
	English	3
	Social science, including 1 unit in American history or civics, or a combination of the 2, with an intensive study of United States and Texas Constitutions.	2
	Mathematics	2
	Science	1
	Electives	[8]

[5] Grades 10, 11, and 12. Only the credits earned in these grades are counted for graduation. Constant subjects in the 9th grade include 1 unit of English, 1 of social studies, 1 of mathematics, 1 of general science, plus health and physical education.

[6] A 3-year senior high school, if it elects to do so, may graduate pupils on the basis of 12 units earned in senior high school plus 4 units automatically allowed for completion of the work of the local State approved 3-year junior high school.

[7] Also required are 1 major of 3 units and 2 minors of 4 units, leaving 2 units of free electives.

State requirements for high school graduation—Continued

State, with total units required	Subject requirements	Required and elective units
Texas, 16	All pupils who enter the 9th grade at or after the beginning of the 1958–59 school year must complete the following in addition to health and physical education:	
	English	3
	Social science: World history 1; American history 1; government, including United States and Texas Constitutions ½.	2½
	Mathematics	2
	Laboratory sciences (2 years of vocational courses or 2 years of a foreign language may be accepted as an alternate for 1 year of science).	2
	Electives	[6½]
	Graduates of a particular high school shall be awarded the same type of diploma. The transcript rather than the diploma will record individual accomplishments and achievements.	
Utah [8]	English (speech, journalism, foreign language, etc., may be substituted for 11th or 12th grade English).	3
	Social studies, including 1 unit of American history and govment.	2
	Mathematics [9]	1
	Science, either physical or biological	1
	Health	½
	Physical education, 2 years	1
	Homemaking (for girls) [9]	1
	Industrial arts (for boys) [9]	1
	Electives	
	Any student on a personal-guidance basis may be exempted from meeting any 1 unit of these requirements provided the number so exempted does not exceed 5 percent of the class enrollment; any student may be exempted from meeting 2 of the units provided the number so exempted does not exceed 2 percent of class enrollment.	
Vermont, 16	English, 1 unit of which may be in business or general English, grammar, creative writing, journalism, or speech.	4
	Social studies, including 1 unit of United States history	2
	Mathematics	1
	Natural science	1
	Electives	[8]
Virginia, 16	English (journalism or speech may be substituted for 12th grade English).	4
	Social studies: Virginia and United States history 1, Virginia and United States government 1.	2
	Mathematics	1
	Laboratory science	1
	Electives	[8]
	Health and physical education, 4 years.	
Washington, 16	English	3
	Social studies: United States history and government 1; Washington State history and government ½; contemporary world history, geography and problems 1.	2½
	Mathematics	1
	Laboratory science	1
	Practical arts or home economics and home relations	1
	District requirements and electives	[7½]
	Health and physical education, 2 years.	
West Virginia, 16	English (1 year may be journalism, speech, etc.)	4
	Social studies, including 1 year of American history	3
	Mathematics [10]	1
	Science: Biology	1
	Physical education: 4 years, 2 periods weekly	1
	Electives	[6]
Wisconsin, 16	Electives	[16]
	4 years of health and physical education, safety, and fire prevention, and a unit in conservation and cooperatives are required.	
Wyoming, 16	No requirements	
	Electives	[16]
	The State Board recommends 3 years of English, 2 years of social science, 2 years of mathematics, and 2 years of science.	

[8] Under study by a committee, fall 1957. Will be stated for senior high school, grades 10–12. Unit requirements itemized are for grades 10–12.

[9] A unit in this field in the 9th grade will meet this requirement. Such a unit, however, will not count toward the required number of units for senior high school graduation.

[10] Strongly suggests a 2d year be required.

State requirements for high school graduation—Continued

State, with total units required	Subject requirements	Required and elective units
District of Columbia 17½	English	4
	Social studies: 1 unit of United States history and ½ unit of government.	1½
	Mathematics	1
	Science	1
	Health, physical education and safety	1½
	Electives	[8½]
	Pupils must be in residence for 1 year immediately preceding graduation.	
	The District of Columbia has 4 curriculums: honors, regular, general, and basic. For each of these except the general, pupils must take additional required courses. Those added for the regular (college preparatory) curriculum are 1 year of mathematics and 2 years of foreign language.	

Changes in enrollments in science and mathematics in public high schools, and related data

Item	Typical grade	Typical age group	Year			Percent of increase, 1948–49 to 1956–57
			1948–49	1954–55	1956–57	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Subject:						
General science	9		1,074,000	(1)	1,518,000	41.3
Biology	10	15	996,000	1,294,000	1,430,000	43.6
Chemistry	11	16	412,000	483,000	520,000	26.2
Physics	12	17	291,000	303,000	310,000	6.5
Other science	9–12		155,000	(1)	265,000	71.0
Total, science	9–12		2,928,000	(1)	4,043,000	38.1
Elementary algebra	9	14	1,042,000	1,205,000	1,518,000	45.7
Intermediate algebra	11	16	372,000	432,000	484,000	30.1
General mathematics	9	14	650,000	800,000	976,000	50.2
Plane geometry	10	15	599,000	664,000	788,000	31.6
Solid geometry	12	17	94,000	147,000	160,000	70.2
Trigonometry	12	17	109,000	170,000	200,000	83.5
Other mathematics	9–12		91,000	(1)	275,000	202.2
Total, mathematics	9–12		2,957,000	(1)	4,401,000	48.8
Grade:						
9			1,641,000	2,288,000	2,254,000	37.4
10			1,491,000	2,296,000	1,933,000	29.6
11			1,242,000	2,258,000	1,513,000	21.8
12			1,026,000	2,169,000	1,263,000	23.1
9 to 12			5,399,000	9,011,000	6,963,000	29.0
Population age group:						
14			2,126,000	1,997,000	2,556,000	20.2
15			2,140,000	1,782,000	2,393,000	11.8
16			2,231,000	1,500,000	2,292,000	2.7
17			2,206,000	1,304,000	2,300,000	4.3
14 to 17			8,703,000	6,583,000	9,541,000	9.6

[1] Information not available.

Enrollments in public high schools in certain science and mathematics courses expressed as the percentage of pupils in grade where course is usually offered, fall 1956

Course:	*Percent of pupils enrolled*
General science (9th grade)	67.3
Biology	74.0
Chemistry	34.4
Physics	24.5
General mathematics (9th)	43.1
Elementary algebra	67.0
Plane geometry	41.6
Intermediate algebra	32.2
Trigonometry	9.2
Solid geometry	7.6

Source: Offerings and Enrollments in Science and Mathematics in Public High Schools (Office of Education Pamphlet No. 120).

Changes in enrollments in mathematics and science in public secondary schools (grades 9–12) and related data, 1948–49 and 1956–57

Item	Typical grade	Year		Percent of increase
		1948–49	1956–57	
Enrollment in:				
General science	9	1,074,000	1,518,000	41.3
Biology	10	996,000	1,430,000	43.6
Chemistry	11	412,000	520,000	26.2
Physics	12	291,000	310,000	6.5
Other science	9–12	155,000	265,000	70.9
Total	9–12	2,928,000	4,043,000	38.1
Elementary algebra	9	1,042,000	1,518,000	45.7
Intermediate algebra	11	372,000	484,000	30.1
General mathematics	9	650,000	976,000	50.2
Plane geometry	10	599,000	788,000	31.6
Solid geometry	12	94,000	160,000	70.2
Trigonometry	12	109,000	200,000	83.5
Other mathematics	9–12	91,000	275,000	202.2
Total	9–12	2,957,000	4,401,000	48.8
Population:				
Age 14		2,126,000	2,555,000	20.2
Age 15		2,140,000	2,393,000	11.8
Age 16		2,231,000	2,292,000	2.7
Age 17		2,206,000	2,300,000	4.3
Age 14–17		8,703,000	9,541,000	9.6
Enrollment in:				
Grade 9		1,641,000	2,254,000	37.4
Grade 10		1,491,000	1,933,000	29.6
Grade 11		1,242,000	1,513,000	21.8
Grade 12		1,026,000	1,263,000	23.1
Grade 9–12		5,399,000	6,963,000	29.0

Source: Offerings and Enrollments in Science and Mathematics In Public High Schools (Office of Education Pamphlet No. 120).

Number and percentage of pupils enrolled in science and mathematics courses in the last 4 years of public secondary day schools, 1889–90, 1948–49, 1956–57

	Years					
	1889–90		1948–49		1956–57	
	Number	Percent	Number	Percent	Number	Percent
General science			1,121,980	20.8	1,518,000	21.80
Biology			995,930	18.4	1,430,000	20.53
Physiology	142,401	27.4	53,592	1.0		
Earth science	154,513	29.8	20,575	.4		
Chemistry	40,084	7.7	412,401	7.6	520,000	7.46
Physics	98,846	19.0	291,473	5.4	310,000	4.45
Algebra	292,287	56.3	1,448,966	26.8	2,002,000	28.75
Geometry	142,235	27.4	693,280	12.8	948,000	13.61
Trigonometry	9,915	1.9	108,551	2.0	200,000	2.87

NOTES

Enrollments are total enrollments in the subject grades 9 through 12.
Percents indicate the percentage of pupils in the last 4 years of high school who are enrolled in the subject.
Table should be read as follows: In 1956–57, 1,518,000 pupils were enrolled in general science courses. This number is 21.8 percent of the total number of pupils enrolled in grades 9 through 12.

SCHOOL DATA

Percent of high schools offering science courses

Course	Years		
	1947–48	1954–55	1956–57
General science	77.4		85.3
Biology	85.2	89	90.3
Chemistry	49.4	57	63.8
Physics	47.8	52	56.8
Neither physics nor chemistry		23	18.2

NOTE.—Comparable data not available for mathematics courses.

TEACHER SUPPLY

Total number of (bachelor's degree) graduates prepared for secondary school teaching, by field of preparation in 1948, 1950, 1954, and 1957 [1]

Field of preparation	1948	1950	1954	1957	1948–57 net change
Mathematics	2,781	4,618	2,223	2,892	+111
Science	4,382	9,096	3,641	5,044	+662

[1] The year 1948 is the 1st year for which these data are available; 1950 is the year in which the highest number of graduates were prepared for secondary school teaching; 1954 is the low; 1957 the most recent.

Source: National Education Association, Research Bulletin, vol. XXXV, No. 3, October 1957, p. 113.

TEACHER PLACEMENT

Percent of graduates with qualifications for standard teaching certificates who entered teaching in September following graduation, 1953 through 1956

Field of preparation	1953	1954	1955	1956
Mathematics:				
Men	39.3	52.9	65.5	65.3
Women	64.1	69.3	70.5	68.0
Total	46.5	59.0	67.3	66.3
Science: [1]				
Men	34.9	44.7	53.5	58.6
Women	50.5	52.0	63.6	61.6
Total	38.2	47.0	56.4	59.4

[1] Includes graduates with major in the comprehensive field of science, or in biology, or chemistry, or physics.

Source: National Education Association, Research Bulletin, vol. XXV, No. 3, October 1957, p. 114.

STATE SUPERVISION IN MATHEMATICS AND SCIENCE

FULL-TIME MATHEMATICS

Texas: Ida Mae Bernhard, consultant in secondary education (spends full-time in mathematics), Texas Education Agency, Austin.

New York: Frank Hawthorne, supervisor of mathematics, New York State Education Department, Albany.

Connecticut: (Is recruiting for a consultant in mathematics).

FULL-TIME SCIENCE

Texas: Oren Whitehead, consultant in science, Texas Education Agency, Austin.
Connecticut: Ralph Keirstead, consultant, science education, State department of education, Hartford.
New York: Hugh Templeton, supervisor of science, New York State Education Department, Albany.
Virginia: F. D. Kizer, assistant supervisor of secondary education (spends fulltime in science), Virginia State Board of Education, Richmond.

COMBINED MATHEMATICS AND SCIENCE

North Carolina: Henry A. Shannon, adviser, science and mathematics, North Carolina State Department of Public Instruction, Raleigh.
Pennsylvania: Lee Boyer, specialist for mathematics and science, State department of public instruction, Harrisburg.
Georgia: H. V. Bullock, science consultant, State department of education, Atlanta.
Louisiana: Howard P. McCollum, supervisor of science, State department of education, Baton Rouge.

STATE STATUS STUDIES OF HIGH SCHOOL MATHEMATICS AND SCIENCE INSTRUCTION SINCE 1950

California:
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Science Instruction in California High Schools, bulletin of the California State Department of Education, volume XXIV, No. 3, July 1955, 77 pages.
Illinois: Report on the Teaching of Science in Illinois. Southern Illinois University, Carbondale, 1957, 34 pages.
Indiana: Characteristics of the Mathematics and Science Teachers for 1956–57. Indiana Research Bulletin, volume 4, No. 4, September 1957, 9 pages.
Kansas:
Offerings and Enrollments in the Secondary School Sciences in Kansas in 1954–55. The Emporia State Research Studies, volume 4, No. 3.
Teachers of Science in the High Schools of Kansas 1955–56. By Weldon N. Baker and Merle E. Brooks. Kansas State Teachers College, Emporia, 1957, 60 pages.
Maine: Report of Survey of Subjects in Grades 9–12 by 1957 Seniors in Maine Secondary Schools, April 26, 1957.
New Hampshire:
Mathematics Course Offerings and Enrollments in New Hampshire Secondary Schools, April 1957.
Science Course Offerings and Enrollments in New Hampshire Second Schools, April 1957.
New Jersey:
Science and Mathematics Teaching in New Jersey Public High Schools: A Study of Present Status. Research Report 179, May 1956, 17 pages.
A Countywide Mathematics-Science Survey: A Report of the Mathematics and Science Courses Completed by 5,074 Twelfth Grade Students who Graduated in June 1956 from Twenty-two Public High Schools in Essex County, N. J. Essex County Superintendent of Schools, Newark, N. J., 1956, 12 pages.
New York City: A Study of the Science and Mathematics Courses Elected by the 1956 Senior Class, and the Number of Seniors Who Planned to Specialize in Scientific Fields in the Academic High Schools in New York City. By Samuel Schenberg, Supervisor of Science, Board of Education, New York City, June 1957, 31 pages.
Wisconsin: The Status of Science Offerings in Wisconsin Schools in 1955–56. October 3, 1956, 31 pages. (Prepared by Milton O. Pella, School of Education, University of Wisconsin.)

Basic and minimum requirement for authorization to teach mathematics or science

State	Mathematics		Science		Phys. Science		Chemistry		Physics		Biol. Science		Biology		General Science	
	BR	MR	BR	MR	BR	MR	BR	MR	BR	MR	BR	MR	BR	MR	BR	MR
Alabama	24	18	[a] 24	18	24	18	24	18	24	18	24	18	24	18	24	18
Alaska* [a]	M	m	M	m	M	m	M	m	M	m	M	m	M	m	M	m
Arizona	15	15	15	15	15	15	(a)		(a)		15	15			15	15
Arkansas	[b] 15	15	[c] 24	24												
California* [a]	36	20	36	20	36	20					36	20			36	20
Colorado*	[c] 12		[d] 12		12		[c] 5		[c] 5		[f] 12	5	[c] 5		[d] 12	
Connecticut	[c] 18	18					18	18	18	18	18	18			21	21
Delaware [a]	24						18		18		18				(c)	
District	30		30		30						30				24	
Florida	15		32				15		15				15		12	
Georgia * [a]	[b] 20	20	[c] 33	33	(d)		(d)		(d)		(d)		(d)		(d)	
Hawaii	[a] 14	14			32	24					32	24			36	24
Idaho	15	15			15	15	15	15	15	15	20	20	15	15	[a] 24	24
Illinois*	[a] 16	16	16	16	16	16					16	16			16	16
Indiana [a]	40	24	40	24	40	40					40	40	24	24	40	24
Iowa* [a]	[d] 15	12	[b] 15	15	[b] 15	15	(b)		(b)		[b] 15	15	(b)		[b] 15	15
Kansas*	15	6	24	6	24	6	6	6	6	6	24	6	6	6	24	6
Kentucky [a]	24	18	[d] 48				24	18	24	18			24	18	(c)	
Louisiana	18	18	[b] 18				12	12	12	12	12	12	(b)		(b)	
Maine* [a]	[d] 18	18	[c] 40				[f] 24	24	[f] 24	24			[f] 24	24	18	[g] 18
Maryland	[a] 18	18	[b] 27	27			18	18	18	18			18	18	[b] 27	27
Massachusetts [a]	18	9	18	9	18	9	18	9	18	9	18	9	18	9	18	9
Michigan	15		15		15		15		15		15		15		15	
Minnesota	[a] 24	15	[b] 24	15	[b] 24	15					[b] 24	15			24	15
Mississippi	18	18	24	24			12	12	8	8	12	12			24	24
Missouri	15	15					[b] 15	15	[b] 15	15	[c] 15	15	15	15	[d] 15	15
Montana	30	20			30	20					30	20				
Nebraska* [a]	15	12	15	12	15	12	[b] 15	[c] 12	[b] 15	[c] 12	15	12	[b] 15	[c] 12	15	12
Nevada*	M		M		M		M		M		M		M		M	
New Hampshire [a]	18	6	18	6												
New Jersey	18	18	30	30	18	18	18	18	18	18	18	18	18	18	18	18
New Mexico*	15	10	15	10	15	10	15	10	15	10	15	10	15	10	15	10
New York [a]	[b] 15	15	30	30			18	18	18	18			18	18	30	30
North Carolina	21		30				12		12				12		18	
North Dakota* [a]	30	15	30	15	30	15	30	15	30	15	30	15	30	15	30	15
Ohio		18		45		[b] 21						[c] 15				[d] 21
Oklahoma	[c] 24	16	30	16			30	16	30	16	30	16	30	16	30	16
Oregon*	12	12			8	8	[b] 12	12	[c] 12	12			8	8	16	16
Pennsylvania	18	18	18	18	18	18					18	18			18	18
Puerto Rico*	15	15	15	15	15	15					30	30				

Puerto Rico*	15	15	15	15	15	15					30	30			18	18
Rhode Island	15	15	30	30	15	15	12	12	12	12	15	15	12	12	15	15
South Carolina	[18–b] 24	18–24	30	30											18	18
South Dakota	15	15	15	15	[a] 15	15	16	16	16	16	[b] 15	15	16	16	[a] 15	15
Tennessee	18	18	[b] 32	32											[a] 16	16
Texas	36	18	36	18	36	18	24	18	24	18	36	18	24	18	36	18
Utah*	20	12	20	12	40	12	20	12	20	12	20	12	20	12	40	12
Vermont*	24	12	24	12			24	12	24	12			24	12	24	12
Virginia	12	12			(a)		12	12	12	12			12	12	[b] 18	18
Washington* [a]	M	m	M	m	M	m	M	m	M	m	M	m	M	m	M	m
West Virginia	18	15			[a] 24	15					[b] 24	15			(c)	
Wisconsin	15	15	15	15	15	15	15	15	15	15			15	15	(a)	
Wyoming [a]	[b] 24	6	24	6			24	6	24	6			24	6	24	6

BR—Basic Requirement—for teaching subject full time, for a major fraction of the schoolday, or in the highest classification of schools.

MR—Minimum Requirement—for teaching subject part time, for a minor fraction of the schoolday, or in the lowest classification of schools.

M—Major.
m—minor.

*High-school certificate is of the blanket type for academic fields; authorized teaching fields not endorsed on certificate; where requirements for teaching are listed, these are enforced by employing school officer or accrediting regulations.

Alabama

[a] This work must include biology, chemistry, and physics.

Alaska

[a] Specification is that teaching field preparation must meet standards of Northwest Association of Secondary and Higher Schools, which is a major or minor of 16 and 12 semester hours, respectively.

Arizona

[a] Applicant must have adequate preparation in subject to be certified to teach same.

Arkansas

[b] Deductions to the extent of 2 semester hours for each high school unit in this field may be permitted. Maximum is 6 semester hours.

[c] Must include 8 semester hours in biology, 8 semester hours in chemistry, and 8 semester hours in physics.

California

[a] The general or blanket certificate for teaching all academic fields in high school requires completion of 5 years of college preparation, with a major and a minor in fields commonly taught in high schools, including 40 semester hours of general education. A major for a field, other than the special fields is 36 semester hours. A minor in any field is 20 semester hours for the general certificate. Assignment to teaching fields is left to employing school official.

Colorado

[c] 3 semester hours maximum deduction permissible for high-school units.

[d] Minimum requirement, 5 semester hours except general science which requires 12 semester hours including physical and biological science.

[e] Including physics and chemistry.

[f] Including physical and biological science.

Connecticut

[a] For grades 7 to 9, professional certificate in mathematics may be granted on the basis of 12 hours including calculus; additional content preparation must be completed before issuance of standard certificate.

Delaware

[a] Delaware does not certificate a teacher who has less than the basic requirement, but does allow a teacher to teach 1 class in an academic subject on 8 semester hours' preparation, or 2 classes on 12 semester hours, along with the subjects for which he is certified.

[c] In a school so small that 1 teacher has to teach all the science, a high school general science certificate is issued on a total of 24 semester hours in the general field.

Georgia

[a] BR and MR refer to requirements for listing of fields on certificates.

[b] Must include 12 semester hours in pure mathematics.

[c] Must include courses in biology, chemistry, and physics; 12 semester hours in 1 science.

[d] Included in the broad field of science.

Hawaii

[a] In addition to solid geometry and trigonometry; including course in teaching mathematics.

Idaho

[a] Seldom give endorsement for general science. Course work in several areas is required.

Illinois

[a] Requirement for special certificate in mathematics is 36 semester hours. Applicant for a high school certificate may be authorized to teach math with a minimum of 8 semester hours if he has completed a major in the field of natural science.

Indiana

[a] English, foreign languages, mathematics, and science are not authorized on general or blanket certificate; the remaining fields are so authorized.

Iowa

[a] Iowa actually issues 2 authorizations: a general certificate and an approval statement. Special certificates with the subject or service area endorsed thereon are available in the following areas: art, industrial arts, education of exceptional children, and librarianship.

[b] Standards require a total of 15 semester hours in field with some credit in the subject taught.

[d] Deduction from basic requirement as follows: 1 semester hour for each high school unit in advanced algebra, trigonometry or solid geometry; total deduction not to exceed 3 semester hours.

Kentucky

[a] Specialization requirements for certification may be completed under any one of the following options in accordance with these definitions:

Area of concentration: Concentration usually 48 semester hours, in accordance with an approved plan designed to insure well-rounded specialization in the area.

Major: Minimum of 24 semester hours in accordance with scope and sequence appropriate for the subject. Majors in English, health and physical education, and speech and dramatics require 30 semester hours.

Minor: Minimum of 18 semester hours in accordance with scope and sequence.

Specialization option 1: An area of concentration.

Specialization option 2: 2 majors.

Specialization option 3: 1 major and 2 minors.

Specialization option 4: 1 major and 1 minor when credit in both is 48 semester hours (54 when English is included as a major).

Where 2 numbers are listed, the first is for the area of concentration, the second is for the major.

Single numbers refer to majors only.

Before a teacher is to be assigned to a subject with less than a minor of 18 semester hours, approval must be secured by the local school superintendent from the Head of the Bureau of Instruction of the State Department of Education.

[d] Area in natural science—48 semester hours including at least 12 each in biology, chemistry, and physics, but with 15 in at least 1 of the 3, plus 3 semester hours in geology, the remainder electives.

[e] No separate certification in general science. A teacher qualifies for general science if certified in the science area of concentration or in chemistry, physics or biology as major or minor subjects.

Louisiana

[b] 6 semester hours each in biology, chemistry, and physics gives authorization in general science. An additional 6 semester hours in any 1 of the 3 gives authorization in that 1.

Maine

[a] *Academic fields:* The general certificate requires a 24-hour major and (*a*) a 15-hour minor or (*b*) 2 12-hour minors except in Latin and mathematics. In the latter subjects, 18 hours make a major and 12 semester hours a minor—6 hours if 1 of 2 minors. Alternatively, the general certificate is issued on the basis of a 40-hour area: English, mathematics and science, or social studies. If general certification major and minor qualifications cannot be met, a limited or endorsed certificate may be issued for any academic subject in which an applicant offers 12 hours (or 8 semester hours in Latin and mathematics).

[d] 18 semester hours if major; 12 semester hours if single minor; 8 semester hours if 1 of 2 minors.

[e] Math and science: 40 semester hours for broad field; both subjects may be included.

[f] 24 semester hours if major; 15 semester hours if a single minor; 12 semester hours if 1 of 2 minors.

[g] Must include 6 semester hours in each of the following: biology, chemistry, and physics.

Maryland

[a] Deduction of not more than 6 semester hours allowed for high school credit.

[b] Must include 6 semester hours each in chemistry, physics, and biology; at least 12 semester hours in 1 of these 3 sciences; and 3 semester hours in other sciences, such as the following: geology, astronomy, meteorology, radio, agriculture conservation.

Massachusetts

[a] All secondary certificates and special-subject certificates have the same requirements—18 semester hours in the major field or fields (authorized to teach full time) and 9 semester hours in minor-subject fields (authorized to teach minor fields up to 50 percent of total teaching time).

All secondary certificates and special-subject certificates are special certificates in that a certificate is issued for each subject or field requested (assuming the applicant meets all the requirements). Thus, an applicant who qualifies in 2 major fields may apply for and receive 2 certificates; 1 for each field.

Minor fields are recorded in the office of the Division of Teacher Certification and Placement, but are not recorded on the teacher's certificate.

Minnesota

[a] 2 semester hours per unit of high school credit allowed, but not to exceed 6 semester hours.

[b] Major or minor concentration in general use; some college credits in specific subject required.

Missouri

[b] 15 semester hours plus 9 semester hours in other science.

[c] 15 semester hours in any biological science, plus 9 semester hours in other science; may then teach biology, zoology, or botany.

• No separate certification in general science. A teacher qualifies for general science if certified in the science area of concentration or in chemistry, physics or biology as major or minor subjects.

[b] 15 semester hours plus 9 semester hours in other science.

• 15 semester hours in any biological science, plus 9 semester hours in other science; may then teach biology, zoology, or botany.

[d] May teach general science, grades 9 to 12, with 5 semester hours biological science, 5 semester hours chemistry, 5 semester hours physics, plus 9 semester hours other science. May teach grades 7 to 9 with 5 semester hours biological science, 5 semester hours chemistry, 5 semester hours physics.

Nebraska

[a] Basic requirement is for "accredited" school; minimum requirement is for "approved" school.

[b] 15 semester hours in science including 8 semester hours in specific science taught.

• 12 semester hours in science including specific preparation in each science course taught.

New Hampshire

[a] Basic requirement includes 6 semester hours in each subject (i. e., 18 in science but to teach basic or minimum 6 semester hours in particular subject).

New York

[a] Requirements for academic certificates will change September 1958.

[b] Maximum of 6 semester hours deduction allowed for high school credit.

North Dakota

[a] Each high school teacher of subjects in the academic fields—English, foreign languages, mathematics, natural sciences, and social studies—shall teach only in the field or fields indicated in which he has the equivalent of a minor in college preparation. 15 semester hours, or the number of credits required by the North Central Association for determining a minor in any field, is considered the standard for interpreting this requirement.

Ohio

[b] Must include basic courses in chemistry and physics.

• Or basic courses in biology, zoology, and botany.

[d] Must include basic courses in physics, biology, and chemistry.

Oklahoma

• High school credit in intermediate algebra and solid geometry may be counted, respectively, for 3 semester-hours and 2 semester-hours in meeting this requirement.

Oregon

[b] Must include 4 semester hours in chemistry.

• Must include 4 semester-hours in physics.

South Carolina

[b] High school trigonometry may be used as 3 of the 24 semester-hours; high school solid geometry may be used as 3 of the 24 semester-hours.

South Dakota

[a] At least 8 semester hours must be in the science taught.

[b] With at least 3 semester hours each in zoology and botany.

• The preparation must be in at least 2 fields.

Tennessee

[b] Must include 3 areas.

• Must include both biology and physical science.

Virginia

[a] Must include 6 semester hours in analytical geometry or calculus.

[b] Must include courses in botany and zoology.

Washington

[a] Graduates of Washington institutions now obtain the general certificate, which is valid for teaching kindergarten through grade 12. This should not be interpreted to mean that holders of these certificates have not met certain requirements in fields of concentration, or in major and minor subject fields. State board of education accreditation of junior and senior high schools is one of the controls which influence assignment of teachers to their proper fields.

West Virginia

[a] Must include 12 to 16 semester hours in chemistry and 8 to 12 semester hours in physics.

[b] Must include 6 to 8 semester hours in biology, 4 to 8 semester hours in zoology, and 4 to 8 semester hours in botany.

• General science is added to field of physical science by adding 10 semester hours of biology, including general biology or botany and zoology; and to biological science by adding 10 semester hours of chemistry and physics to 6 hours of chemistry required for field of biological science.

Wisconsin

[a] With work in at least 3 sciences.

Wyoming

[a] Certificates are usually endorsed by fields (e. g., English, science) since few teachers in the State teach a particular subject for a major portion of the day. However, individual subject endorsements are available for teachers with the required 24 semester hours.

Minor teaching fields are not endorsed on the certificate. These assignments are entrusted to the local administrator. Accreditation enforces a minimum of 1 year of college work in each minor subject taught.

[b] A maximum of 6 semester hours may be allowed for high school work in the subject.

(Pamphlet, Offerings and Enrollments in Science and Mathematics in Public High Schools, 1956, printed by U. S. Department of Health, Education, and Welfare, Office of Education, is filed with the committee and is available for reference.)

Mr. ELLIOTT. Do you have any questions, Mrs. Green?

Mrs. GREEN. No, sir.

Mr. ELLIOTT. Mr. McGovern?

Mr. MCGOVERN. No, sir.

Mr. DERTHICK. Mr. Chairman, we will abbreviate rather sharply the testimony on foreign language, but I do want to register a point or two there. Education in this country is not yet preparing Americans effectively to live and serve overseas. There is evident need to improve American school and college curricula to prepare men and women to serve in the whole of the world.

Until recently, little attempt has been made to begin language learning in American schools during the period most favorable for learning to understand and speak a second language. Traditionally we have waited until age 14 to 15. Then we have attempted the impossible by providing only 2 years on the average in high school or college for learning to understand, speak, read and write a second language.

Mr. ELLIOTT. I see Dr. Neal, a Member of Congress from the State of West Virginia, in our audience.

Doctor, will you come and sit with the committee?

Dr. NEAL. I am doing very well here, thank you very much, Mr. Chairman.

Mr. ELLIOTT. We are very happy to have you with us.

Dr. NEAL. Thank you.

Dr. DERTHICK. The U. S. S. R. has moved ahead rapidly in language instruction. Besides maintaining special language schools, in which all the instruction in the upper grades is conducted in a foreign language, they require language study for 6 years in their 10-year schools. Russian university students are required to study a second language which must be of a country in Asia or Africa.

In negotiations and activities conducted by Americans in foreign countries, we are constantly reminded of the language ability of the Russians who may be competing with the United States in such negotiations. We have frequent proof that entire Soviet delegations will be fluent in the native language of the country in which an international conference or bargaining may be taking place, in contrast to very limited language competence of the American delegation.

Foreign language competence may no longer be defined as several years of study to achieve a reading knowledge. The requirement increasingly today is for Americans with the ability to communicate fully in a foreign language—we need those who can speak, write and read, with particular emphasis upon the spoken language.

To initiate action to strengthen America's language capabilities, the bill would authorize a foreign language development program to

improve the language competence of teachers now in service by the establishment of foreign language institutes. It would also provide for more adequate resources for training in the languages which are not now commonly taught in the United States, or not taught at all, by the establishment of foreign language training and service centers in institutions of higher education. Provision would be made also for surveys of the specific needs for the extension of foreign language instruction, research in teaching methods, and for the development of specialized training materials.

Mr. Chairman, for the record we have an insert that we would like to supply. On account of the snow, it did not get in this morning, but, if we may, we would like to submit it later.

Mr. ELLIOTT. Without objection, the insert may be offered for the record at a later time.

(Insert referred to was subsequently supplied and follows:)

SUPPLEMENTAL STATEMENT OF LAWRENCE G. DERTHICK, COMMISSIONER OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

LANGUAGE IN HIGH SCHOOL

Language enrollments in public secondary schools of the United States

Year	Total high school enrollment	Percent Latin	Percent modern languages	Percent French	Percent German	Percent Spanish
1890	202,963	34.7	16.3	5.8	10.5	----------
1895	350,099	43.9	17.9	6.5	11.4	----------
1900	519,251	50.6	22.1	7.8	14.3	----------
1905	679,702	50.2	29.3	9.1	20.2	----------
1910	915,061	49.0	34.3	9.9	23.7	0.7
1915	1,328,984	37.3	35.9	8.8	24.4	2.7
1922	2,230,000	27.5	27.4	15.5	.6	11.3
1928	3,354,473	22.0	25.2	14.0	1.8	9.4
1934	5,620,625	16.0	19.5	10.9	2.4	6.2
1949	5,399,452	7.8	13.7	4.7	.8	8.2
1955	6,582,300	6.9	13.7	5.6	.8	7.3

Source: The National Interest and Foreign Languages, revised edition, January 1957.

THE SITUATION IN SECONDARY SCHOOLS

Of all public high schools in the United States, 56.4 percent offer no modern foreign language instruction to their students. To put this another way, not half of the public high schools in 25 States teach modern foreign languages. These statistics have significance for any who believe that all American youth should have at least the opportunity of study languages. Requirements, choice of language, length and character of instruction are not in question in a majority of our public schools; modern languages are simply not available.

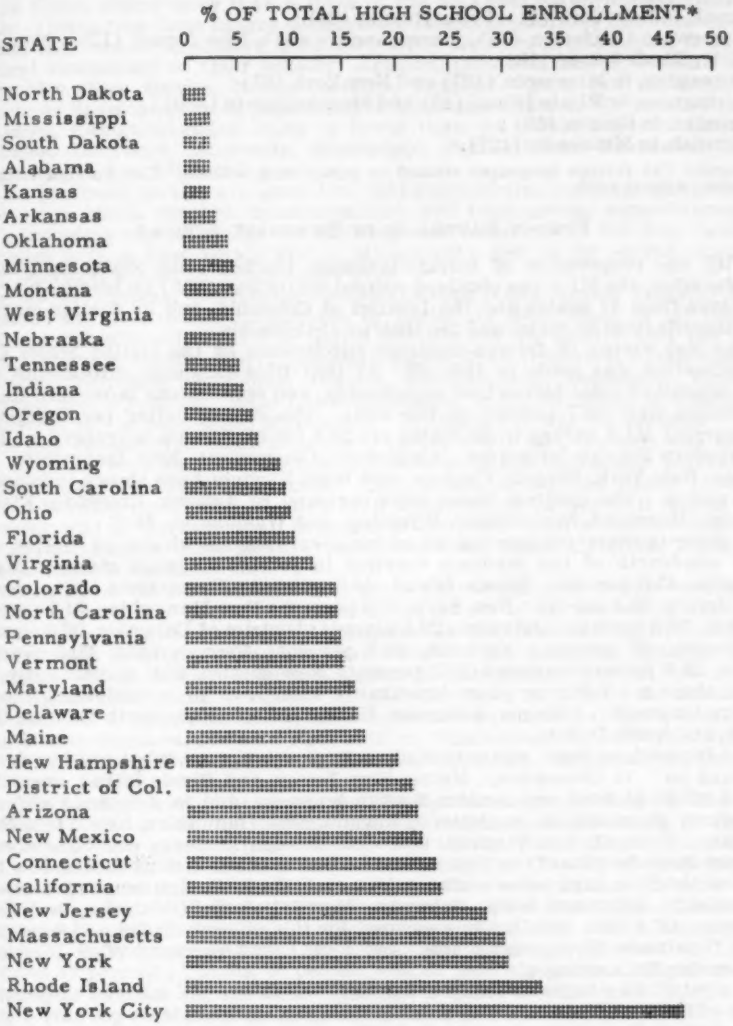
The situation differs greatly from region to region. In Connecticut, Maine New Jersey, and Rhode Island, every public high school offers some instruction in modern foreign languages. In the Dakotas, Iowa, and Nebraska, not 1 high school in 10 does so. These are the extremes. The percentages of the other States may be seen in the following table.

Percentages of public high schools offering modern foreign languages

Connecticut, Maine, New Jersey, Rhode Island	100.0
California	97.6
Massachusetts	95.2
New Hampshire	94.6
Delaware	94.1
Arizona	88.3
Vermont	87.3
New York	87.1
Virginia	83.0
North Carolina	80.1
Maryland	75.5
Nevada	75.0
Washington	72.6
District of Columbia	70.6
New Mexico	66.7
South Carolina	64.7
Michigan	58.1
Wyoming	56.3
Illinois	54.4
Pennsylvania	54.3
Ohio	49.9
Colorado	49.1
Florida	45.3
Georgia	42.4
West Virginia	39.5
Texas	39.4
Oregon	38.4
Idaho	33.3
Utah	32.9
Louisiana	26.7
Tennessee	26.6
Indiana	24.5
Alabama	23.0
Minnesota	22.9
Missouri	21.8
Montana	21.3
Kentucky	19.5
Kansas	19.3
Mississippi	18.1
Arkansas	12.9
Oklahoma	10.1
Nebraska	9.9
Iowa	8.3
South Dakota	7.6
North Dakota	4.4

Source: The National Interest and Foreign Languages, revised edition, January 1957.

MODERN FOREIGN LANGUAGES IN U.S. PUBLIC HIGH SCHOOLS



*The table does not include incomplete data received from 12 additional States.

Source: Parker, William Riley. The National Interest and Foreign Languages, revised edition, January 1957. Page 12.

In addition to Latin, French, German, and Spanish, other languages are studied in the public high schools of several States:

Italian, in California (450 pupils), Connecticut (943), Massachusetts (1,595), Nevada (61), New Jersey (3,263), New York (8,596), Pennsylvania (927) Rhode Island (571);

Polish, in Connecticut (19), Massachusetts (87), New Jersey (66), Ohio (22), Pennsylvania (220);

Chinese, in California (29);

Greek, in New York (11), Pennsylvania (26);

Hebrew, in California (75), Massachusetts (64), New Jersey (128), New York (4,024), Rhode Island (10);

Norwegian, in Minnesota (127) and New York (37);

Portuguese, in Rhode Island (45) and Massachusetts (339);

Russian, in Oregon (58);

Swedish, in Minnesota (127).

Source: "13 foreign languages studied in public high schools," The Foreign Language program, August 1955.

Foreign Languages in Secondary Schools

With the cooperation of foreign-language teachers and State departments of education, the MLA has obtained current statistics (1955) on foreign-language offerings from 47 States and the District of Columbia, and on foreign-language enrollments from 39 States and the District of Columbia.

The last survey of foreign-language enrollments by the United States Office of Education was made in 1948–49. At that time language enrollments were 21.5 percent of total high-school enrollments, and enrollments in modern foreign languages were 13.7 percent of the total. The corresponding percentages for the current MLA survey in 39 States are 21.3 for all foreign languages, and 14.3 for modern foreign languages. California, Connecticut, New Hampshire, New Jersey, New York, Oregon, Virginia, and West Virginia have shown increases in this period. The greatest losses have occurred in Arizona, Colorado, Florida, Kansas, Maryland, New Mexico, Wyoming, and Washington, D. C.

A State-to-State comparison of current enrollments shows 14 States with over one-fourth of the students enrolled in foreign-language classes: Massachusetts, 45.0 percent; Rhode Island, 44.5 percent; Connecticut, 39.8 percent; New Jersey, 39.4 percent; New York, 37.3 percent; New Hampshire, 31.2 percent; Nevada, 30.5 percent; Delaware, 29.1 percent; District of Columbia, 29.0 percent; California, 28 percent; Vermont, 28.3 percent; Pennsylvania, 26.9 percent; Maine, 26.6 percent; Arizona 25.7 percent; New Mexico, 25.6 percent. By contrast, there are 7 States where less than 1 student in 25 is studying a modern foreign language: Alabama, Arkansas, Kansas, Mississippi, North Dakota, Oklahoma, and South Dakota.

If a high-school pupil wants to study a foreign language, what are his chances of doing so? In Connecticut, Maine, New Jersey, and Rhode Island, every high school offers at least one modern foreign language, and in Arizona, California, Delaware, Maryland, Massachusetts, Nevada, New Hampshire, New York, North Carolina, Vermont, and Virginia, a modern foreign language can be studied in at least three-fourths of the high schools. But in the following States, less than one-fourth of the high schools offer any instruction in foreign languages, modern or ancient; Arkansas, Iowa, Nebraska, North Dakota, Oklahoma, and South Dakota. Of 19,841 high schools covered by this survey, 10,718 (54.0 percent) offer 1 or more foreign languages, and 8,675 (43.7 percent) offer 1 or more modern foreign languages.

If a pupil does begin to study a language, what are his chances of getting 3 years of instruction in it? The great majority of such students get only 2 years of study. Only in California, Kansas, Massachusetts, New York, and Wyoming do more than a quarter of them continue into the third-year course. In the following States more than 90 percent stop at the end of the second year: Arizona, Colorado, Delaware, Minnesota, Montana, North Carolina, Ohio, Oklahoma, South Carolina, Tennessee, Vermont, Virginia, and West Virginia. And in

Idaho, Mississippi, and the Dakotas not a single high school offers a third-year course in any foreign language.

A significant, though not always a determining factor in the wealth of any curricular offering is the size of the school. In a high school with less than 100 pupils, the curriculum may be restricted to the "basic" subjects, and "unusual" subjects like foreign languages, higher mathematics, and science may be forced out. There are 9 States where the median high school enrollment is below 100, and 19 States where more than a third of the high schools enroll less than 100 pupils. Comparing these figures with foreign-language offerings and enrollments, we find that some States have more such study than we might expect from the physical limitations of their schools: Arizona, Colorado, Maine, Nevada, New Hampshire, New Mexico, North Carolina, Vermont. In a few of these, the French- or Spanish-speaking population is a pertinent factor. In another group of States, foreign-language study is lower than we would expect: Alabama, Arkansas, Maryland, Minnesota, Mississippi, Pennsylvania, Tennessee, Utah, West Virginia, and Wisconsin.

Other pertinent factors are annual current expenditures per pupil (instruction, supervision, books, lunches, transportation) and total annual expenditures per pupil, including capital outlay for buildings and interest. In the first category the range is from New York's $352 to Mississippi's $96; in the second category, from Delaware's $497 to Mississippi's $126.

Latin—In Indiana, Mississippi, North Dakota, Ohio, South Dakota, West Virginia, and Wisconsin, enrollments in Latin are more than in all modern foreign languages combined, and Latin enrollments are nearly half the total foreign-language enrollments in Arkansas, Connecticut, Delaware, Idaho, Kansas, Montana, Nebraska, Oklahoma, Oregon, Pennsylvania, Tennessee, Vermont, Virginia, and Wyoming. Total Latin enrollment in the 39 States is 306,618, or 7.0 percent of the total pupil enrollment. In 1948–49 it was 7.8 percent.

The sad decline of German is evident. Forty years ago, German was second only to Latin, with an enrollment of 27.9 percent of the high-school population; its present enrollment is 0.8 percent. Only in New Jersey and Rhode Island is there a German enrollment of more than 2 percent, in 22 States it is less than 1 percent, and no German at all is taught in the public high schools of Alabama, Florida, Mississippi, New Mexico, North Carolina, South Carolina, Tennessee, Vermont, and Wyoming.

French has a total enrollment (in the 39 States included in this survey) of 247,352, which is 5.6 percent of the 247,352, which is 5.6 percent of the high-school population; the corresponding figures for Spanish are 322,937, or 7.4 percent. French is strong, with more than twice the enrollment in Spanish, in the Carolinas and in 5 New England States: Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. Spanish has more than twice the enrollment in French in 10 States in the West and Southwest (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oklahoma, Oregon, Wyoming) and in 9 other States: Florida, Indiana, Kansas, Minnesota, Nebraska, the Dakotas, Tennessee, and Wisconsin.

It has been generally assumed that foreign-language offerings in the high schools of a State and the foreign-language entrance requirements in its colleges would show some correspondence. The survey substantiates this assumption. The schools and colleges in 33 States and the District of Columbia are either above average in both offerings and entrance requirements or below average in both. But in 15 States the percentage of high schools that offer foreign languages is much higher than the percentages of colleges with a language requirement for entrance: Arizona, 88 percent and 0 percent; California, 97.8 percent and 33 percent; Illinois, 76 percent and 23 percent; Indiana, 67 percent and 20 percent; Nevada, 77 percent and 0 percent; New Hampshire, 95.7 percent and 40 percent; New Mexico, 66.7 percent and 0 percent; New York, 95.5 percent and 55 percent; Ohio, 88.3 percent and 30 percent; South Carolina, 70 percent and 17 percent; Vermont, 98.7 percent and 40 percent; Virginia, 83 percent and 36 percent; Washington, 78.7 percent and 31 percent; West Virginia, 58 percent and 8 percent; Wyoming, 66.7 percent and 0 percent.

Source: The Foreign Languages program, August 1955. (See table on p. 350.)

		Modern FL enrollments					FL enrollments (incl. classical)						Latin		French		German		Spanish		% HS with FL		% HS with MFL		% FL drops after 2nd year	size of median HS	% HS with less than 100 pupils		annual exp. per pupil			
		% HSP		rank	gain/loss		% HSP				gain/loss		% HSP		% HSP		% HSP		% HSP										current		total	
		'48	'54	'54	%	rank	'48	rank	'54	rank	%	rank	'54	rank	'54	rank	'54	rank	'54	rank	'54	rank	'54	rank		'51	rank	'51	rank	'51	rank	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
	U. S.	13.7	14.3		+ .6		21.5		21.3		— .2		7.0		5.6		.8		7.4		54.0		43.7		92.1		175		30.3		244		313		U. S.
1	R. I.	31.0	33.4	1	+2.4	1	47.7	1	44.5	2	—3.2	26	11.3	10	19.5	2	2.3	2	8.0	12	100.0	1	100.0	1	82.3	15	458	4	11.5	11	259	21	296	26	R. I.
2	Mass.	30.9	30.1	4	— .8	19	46.7	2	48.0	1	—1.7	17	14.9	2	19.7	1	1.7	5	7.1	16	96.4	8	95.2	6	71.5	4	367	9	7.7	5	267	13	314	23	Mass.
3	New Mex.	30.3	22.0	10	—8.3	49	33.8	8	25.6	19	—8.2	46	3.5	39	.6	44	0	44	21.5	1	66.7	24	66.7	18			134	34	41.0	36	261	19	315	21	New Mex.
4	D. C.	29.0	21.2	12	—7.8	46	43.8	3	29.0	11	—14.8	49	7.8	17	9.9	11	1.6	6	9.7	10	70.6	21	70.6	17	88.6	19	966	1	0	1	301	7	362	11	D. C.
5	New York	28.4	30.2	2	+1.8	4	36.6	6	37.3	6	+ .7	5	7.1	19	13.1	7	2.0	4	12.5	7	95.5	10	87.1	11	58.1	3	383	8	10.7	10	352	1	472	2	New York
6	Nevada[2]	26.8	24.7	6	—2.1	31	31.9	9	30.5	9	—1.4	15	5.8	24	4.1	20	.4	20	18.9	5	77.8	18	75.0	15			87	45	54.1	43	263	16	326	18	Nevada[4]
7	N. J.†	26.8	28.1	5	+1.3	8	39.1	4	39.4	5	+ .3	9	11.4	9	9.4	12	2.9	1	13.7	6	100.0	1	100.0	1	79.2	10	624	3	.1	2	312	4	384	6	N. J.†
8	Arizona	25.6	21.8	11	—3.8	48	30.2	12	25.7	17	—4.5	36	3.9	35	1.1	36	.3	22	20.5	2	88.3	11	88.3	9	95.0	31	245	18	20.0	20	263	16	326	17	Arizona
9	Calif.	22.8	24.0	7	+1.2	6	28.2	16	28.5	12	+ .3	9	4.5	31	3.9	21	.7	14	19.3	4	97.8	6	97.6	5	74.9	7	703	2	6.9	4	261	19	404	4	Calif.
10	Conn.*	22.8	23.4	9	+ .6	7	38.9	5	39.8	4	+ .9	4	16.4	1	12.8	9	1.3	10	7.8	14	100.0	1	100.0	1	80.4	12	458	4	2.3	3	291	8	389	5	Conn.*
11	N. H.	19.3	19.7	14	+ .4	9	29.6	14	31.2	7	+1.6	2	11.6	7	16.9	4	.5	17	2.3	36	95.7	9	94.6	7	84.7	18	173	27	27.9	28	255	23	304	24	N. H.
12	Maine	19.2	16.6	15	—2.6	37	30.9	10	26.6	16	—4.3	34	10.0	12	15.5	5	.2	27	1.0	49	100.0	1	100.0	1	81.5	13	124	38	45.8	39	181	40	209	41	Maine
13	Md.*	18.4	15.7	17	—2.7	40	30.2	12	24.1	20	—6.1	42	8.3	14	9.0	14	.6	15	6.1	20	84.6	14	75.5	14			396	6	9.1	7	243	29	374	7	Md.*
14	Colo.	17.5	14.0	22	—3.5	42	25.6	18	19.9	24	—5.7	41	5.8	24	1.9	25	.4	20	11.7	9	57.5	27	49.1	26	92.7	28	143	32	36.2	33	253	24	339	15	Colo.
15	Del.*	17.2	16.0	16	—1.2	21	34.4	7	29.1	10	—5.3	40	13.2	5	8.4	15	.6	15	6.9	17	97.0	7	94.1	8	94.0	27	225	13	16.0	15	318	2	497	1	Del.*
16	N. Car.‡	16.7	14.2	21	—2.5	35	22.2	20	18.0	25	—4.2	32	3.8	36	11.7	10	0	44	2.5	34	83.7	15	80.1	13	99.2	42	160	30	23.4	24	176	41	236	40	N. Car.‡
17	Wyoming	16.7	8.8	29	—7.9	47	25.8	17	15.4	27	—10.4	47	6.7	20	1.0	37	0	44	7.7	15	66.7	24	56.3	21	74.7	6	96	42	51.5	41	312	4	373	9	Wyoming
18	Vermont*	15.9	14.7	19	—1.2	21	30.6	11	28.3	14	—2.3	21	13.6	4	13.2	6	0	44	1.4	44	98.7	5	87.3	10	91.5	24	131	36	35.8	32	220	34	250	38	Vermont*
19	Penn.*	15.6	14.4	20	—1.2	21	28.9	15	26.9	15	—2.0	20	12.5	6	5.6	19	1.6	6	6.9	17	69.6	22	54.3	23			387	7	9.3	8	264	15	292	28	Penn.*
20	Illinois	14.9					23.2	19													76.6	19	54.4	22			179	24	22.3	23	291	8	374	7	Illinois
21	Florida	14.0	10.3	28	—3.7	44	21.7	22	15.5	26	—6.2	44	5.2	26	1.4	27	0	44	8.8	11	47.1	29	45.3	26	88.8	21	208	18	24.6	25	206	37	287	31	Florida
22	La.	11.9					15.0	28													27.9	38	26.7	33			122	39	42.9	38	237	30	294	27	La.
23	Texas†	11.7					14.4	29													40.0	31	39.4	29			101	40	49.7	40	223	33	290	29	Texas†
24	S. Car.	11.4	9.2	27	—2.2	32	18.0	24	14.0	29	—4.0	30	4.8	27	7.5	16	0	44	1.7	42	70.8	20	64.7	19	98.7	40	143	32	37.6	34	154	44	173	45	S. Car.
25	Wash.	10.7					17.0	27													78.7	17	72.6	16			207	19	31.4	29	284	11	366	10	Wash.
26	Ohio	9.9	9.7	26	— .2	16	21.8	21	20.2	21	—1.6	16	10.6	11	3.5	22	.8	12	5.3	21	88.3	11	49.9	24	94.9	30	219	16	14.5	12	232	31	318	20	Ohio
27	Virginia	9.5	11.9	24	+2.4	1	17.8	25	20.2	21	+2.4	1	8.3	14	6.6	17	.05	34	5.3	21	83.0	16	83.0	12	98.4	37	191	21	21.2	21	169	42	261	36	Virginia
28	Georgia	8.8					13.5	32													47.9	28	42.4	27			134	34	38.4	35	166	43	193	43	Georgia
29	Idaho*	8.4	6.6	30	—1.8	27	14.1	31	11.0	32	—3.1	24	4.4	32	1.2	31	.2	27	5.1	24	35.1	33	33.3	31	100.0	48	173	27	31.6	30	212	35	262	34	Idaho*
30	Mich.[2]	8.3					17.6	26													86.6	13	58.1	20			311	10	9.7	9	267	13	352	14	Mich.[2]
31	Montana	7.2	4.7	37	—2.5	38	14.2	30	9.3	37	—4.9	37	4.6	30	1.2	31	.2	27	3.4	30	30.5	36	21.3	39	97.2	34	91	42	52.8	42	302	6	354	12	Montana
32	Tenn.	7.0	5.1	34	—1.9	29	13.3	33	9.9	36	—3.4	27	4.8	27	1.4	29	0	44	3.7	29	37.6	32	26.6	34	96.1	33	253	14	14.5	12	148	47	188	44	Tenn.
33	Indiana*	6.8	5.5	32	—1.3	25	18.3	23	13.4	30	—4.9	37	8.0	16	1.2	31	.3	22	3.9	26	67.4	23	24.5	35			161	29	21.7	22	253	24	302	25	Indiana*
34	Oklahoma	6.5	3.9	41	—2.6	37	10.2	39	6.2	41	—4.0	30	2.4	45	.6	44	.05	34	3.2	31	12.6	46	10.1	44	94.0	27	90	43	54.1	43	226	32	261	36	Oklahoma
35	Wisc.[2]	6.3	5.1	34	—1.2	21	12.8	34	11.0	32	—1.8	19	5.8	24	1.2	31	1.4	9	2.6	32					84.1	16	203	20	17.7	17	285	10	324	19	Wisc.[2]
36	Mo.*	5.9					9.7	41													27.0	40	21.8	38			127	37	42.5	37	212	35	249	39	Mo.*
37	Oregon*	5.9	6.1	31	+ .2	10	9.9	40	10.3	35	+ .4	6	4.2	34	1.7	26	.4	20	4.0	25	43.7	30	38.4	30			175	25	33.5	31	316	3	418	3	Oregon*
38	Utah	5.7					7.3	47													32.9	35	32.9	32			311	10	16.7	16	196	38	261	36	Utah
39	Kansas	5.6	2.3	44	—3.3	41	11.3	36	4.4	47	—6.9	48	2.1	46	.2	47	.1	31	2.0	39	27.1	39	19.3	41	57.8	1	74	46	61.6	46	246	27	354	12	Kansas
40	Kentucky	5.1					11.7	35													33.4	34	19.5	40			188	23	18.0	18	151	48	163	46	Kentucky
41	Nebraska	4.9	4.9	36	0	14	11.3	36	8.8	39	—2.5	22	3.8	36	.3	42	.2	27	3.9	26	14.8	45	9.9	48			63	48	67.4	47	245	28	270	33	Nebraska
42	Alabama	4.8	2.3	44	—2.5	35	8.1	46	3.6	49	—4.5	35	1.3	49	.9	40	0	44	1.4	44	26.9	41	23.0	36	78.6	9	189	22	27.2	27	150	46	163	46	Alabama
43	Minn.	4.7	4.6	40	— .1	15	8.4	44	7.4	40	—1.0	12	2.8	42	1.0	37	.9	11	2.5	34	30.4	37	22.9	37	98.5	39	215	17	14.6	14	277	12	339	15	Minn.
44	W. Vir.	4.5	4.7	37	+ .2	10	10.6	38	11.0	32	+ .4	6	6.3	21	2.6	24	.01	32	2.3	36	58.6	26	39.5	28	98.2	36	307	12	8.1	6	183	39	205	42	W. Vir.
45	S. Dak.	4.1	2.2	46	—1.9	29	9.3	43	5.4	42	—3.9	29	3.3	40	.1	49	.2	27	1.8	40	12.6	46	7.6	47	100.0	45	68	47	70.0	48	251	26	290	29	S. Dak.
46	Iowa	3.9					9.4	42													18.0	43	8.3	46			90	43	54.3	45	261	19	315	21	Iowa
47	Miss.*	3.7	2.2	46	—1.5	26	8.4	44	5.3	44	—3.1	24	3.2	41	.9	40	0	44	1.3	46	25.8	42	18.1	42	100.0	45	144	31	25.5	26	96	49	126	49	Miss.*
48	Ark.*	2.7	2.8	41	+ .1	12	5.5	49	4.9	45	— .6	11	2.1	46	1.0	37	.04	36	1.8	40	17.4	44	12.9	43	89.0	22	173	27	19.5	19	123	48	158	48	Ark.*
49	N. Dak.	2.1	1.9	49	— .2	16	6.0	48	4.7	46	—1.3	14	2.8	42	.5	46	.1	31	1.2	47	7.5	49	4.4	49	100.0	45	46	49	76.8	49	256	22	279	32	N. Dak.

Source: The FL Program, Report No. 2, August 1955.
Modern Language Association of America, p. 5.

* data for 1953–54 HSP — High School Population
† data for 1952–53 MFL — Modern Foreign Language
‡ data for 1951–52
1 data from 13 out of 36 schools
2 data from 620 out of 780 schools
4 data from 244 out of 448 schools

Language in the Colleges

THE SITUATION IN COLLEGES

When permitted to do so, the faculty of any American liberal arts college expresses its belief or lack of belief in the importance of foreign language study by setting up entrance or degree requirements or both. (In California, faculties of the 11 State colleges are not permitted to do so.) Of 830 accredited institutions currently granting the B. A. degree, 254 (30.6 percent) have a foreign language entrance requirement, 694 (83.6 percent) have a language degree requirement, and an additional 12 with no formal degree requirement are among those with the entrance requirement—making a total of 706 (85.1 percent) that consider foreign language study an essential element in liberal education.

Some of the institutions lacking the entrance or degree requirement do, of course, have a foreign language degree requirement in most of the major fields. Some have never had a degree requirement. Since 1952 there has been a trend toward restoration, or institution, of the language requirement for the B. A. At least 15 colleges or universities in 11 States have taken this step; at least 4 have restored the foreign language entrance requirement; still other places, notably Cornell, Idaho, and Michigan, have recently strengthened or extended their former degree requirements.

Of the 57 accredited liberal arts colleges in New England, only two lack a foreign language degree requirement. In Arizona, Mississippi, South Carolina, Utah, Virginia, and Wisconsin—to mention States in other areas—all colleges granting the B. A. require foreign languages for the degree, as does the one accredited institution of higher learning in Delaware, Nevada, and Wyoming. There are 10 other States, plus the District of Columbia, with a total of 179 liberal arts colleges, in each of which only a single accredited institution lacks a language requirement for the B. A.

It is a nice question whether or not the degree requirement in most institutions is sufficient to make the proficiency acquired meaningful enough in terms of the national interest. In only about 50 places is the requirement expressed solely as a test of proficiency; in most it is, conventionally, a matter of hours and credits.

Of the institutions without a foreign language entrance requirement, most of them abandoned it or came into existence without it because of the decline of language study in the public high schools during the 1920's and 1930's. However, the idea that foreign language study is an important part of preparation for college has not died. A 1952–53 survey of 216 institutions revealed that in half of them at least 50 percent of the freshmen offered 2 or more high school units of foreign languages, and in 41 of them between 90 and 96 percent of the freshmen did so. Upon admission to college, a student may be placed in college language courses or exempted from further study on the basis of high school units offered or a placement test.

If we turn from quantity to quality of college foreign-language instruction, we abandon statistics and objectivity. Much of the instruction appears to be literary and scholarly in its objectives. Perhaps college teachers, particularly those also giving graduate instruction, tend to see future college teachers in their students and therefore give insufficient stress to the aural-oral foreign-language training needed by the future elementary or secondary school teacher, or by the student who will not become a teacher.

We lack accurate figures on the number of students of foreign languages among the nearly 3 million persons now enrolled in our various colleges and universities. At a guess, there are about 500,000. Assuming that this proportion does not change, and assuming the accuracy of predictions that total college enrollments will reach 6.4 million by 1970, it would seem that a considerable number of additional college language teachers need to be trained at once.

What has been happening to language enrollments in colleges can be illustrated from an area in which language study has been relatively free from the damaging effect of its decline in the public high schools. Of the 28,801 students in 28 New England colleges in 1925, 18,629 (64 percent) were studying modern foreign languages; but 24 years later, in 1949, of the 94,546 students in these same 28 colleges, 24,859 (26 percent) were studying modern foreign languages. In other words, although there were 6,230 more students in language classrooms, there had been a 59 percent drop in proportion of students learning foreign languages.

A development in college curricula that has tended to limit foreign language-

Modern Language Association of America, p. 5.

enrollments is "general education" or the "core" curriculum, which prescribes a planned, integrated program for the first 2 years, leaving but few electives, and often putting foreign language courses not in the "core" but among the electives. But in a few institutions, notably at Massachusetts Institute of Technology and the University of Chicago, students may elect to do their core "humanities" course in a section conducted in a foreign language and with readings chosen from the foreign literature.

Source: The National Interest and Foreign Languages, revised edition, January 1957.

NUMBER OF MODERN LANGUAGE TEACHERS IN COLLEGES AND UNIVERSITIES

It was estimated by an official of the American Council of Learned Societies that in 1956 the number of full-time college teachers of French, Spanish, German, Russian, and other modern foreign languages was 6,750: French, 2,250; Spanish, 1,800; German, 1,650; Russian, 150; other, 900.

STUDY OF RUSSIAN IN THE UNITED STATES

It is also obvious that it is unrealistic to limit the choice of languages in high school to the traditional few. Interest in the Russian language at present is great, both among the pupils and the teachers. The United States Office of Education is receiving an increasing number of inquiries regarding the study of Russian.

An editorial in the New York Times, November 26, 1957, states that "we need large numbers of people who can read the Russian language. It is estimated that some 40 percent of all Soviet students study English, and there are large numbers of Soviet citizens in all fields who can read our language. Yet only a few thousand American students study Russian, and the teaching of Russian in our high schools is a rare phenomenon indeed. To meet the obvious need, our high schools and colleges must look again at their language curricula and take steps needed to assure that we know Russian at least as well as we know French, Spanish, and German."

At present there are only nine public schools in the United States known to be teaching Russian: Eveleth High School, Eveleth, Minn.; Washington, Jefferson, Cleveland, and Madison High Schools, Portland, Oreg.; Hicksville High School, Hicksville, Long Island, a New York suburb; the Maine Township High School, Des Plaines, Ill., a suburb of Chicago; Demonstration School, Kent University, Kent, Ohio, and University High School, associated with the University of Minnesota, Minneapolis, which presents a well-rounded 4-year course.

Eight private schools are teaching Russian: Chatham Hall School, Chatham, Va.; Horace Mann, New York City; Phillips Academy, Andover, Mass.; Riverdale Boys and Riverdale Girls School, Riverdale, N. Y.; St. Paul's School, Concord, N. H.; Choate School, Wallingford, Conn., and St. Albans, Washington, D. C.

Two New York City high schools are initiating Russian courses to begin in February 1958. A circular letter has been received from the head of the department of education of the State of South Dakota, indicating desire to introduce Russian in South Dakota high schools.

The State Department of Education of Connecticut plans to undertake a survey, at the secondary level, as to what schools are interested in introducing Russian into their curricula. Oxnard and Camarillo High Schools in California are also considering the introduction of Russian next year.

Several universities have started the program of teacher training in Russian—Brooklyn College, University of Minnesota, Columbia University Teachers College.

The University of Minnesota offers a training program for teachers with Russian language as a minor. Columbia University Teachers College has a summer language training program for Americans of Russian descent who received their academic training abroad. Yale University indicated its willingness to hold a summer seminar to selected well educated native speakers, preparing them to teach later in American secondary schools. New York City Department of Education announced that a group of 30 public school teachers

will start their training in Russian in February 1958 (New York Herald Tribune, Dec. 1, 1957).

There are 183 universities and colleges teaching Russian and about 4,000 students taking the language. Graduate work in Russian is being done in 12 universities: University of California, Columbia University, Fordham University, Harvard University, Indiana University, University of Michigan, University of Minnesota, University of Notre Dame, Syracuse University, University of Washington, Wayne State University, Yale University. Language laboratories are available for the use of Russian language practice in 38 institutions.

There are also several special summer language training programs offered throughout the country: Yale University, University of Indiana, University of Wisconsin, University of Michigan, University of Chicago, University of California, George Washington University, Georgetown University, Colby College, Middlebury College, University of Minnesota, University of Washington, Fordham University, Alliance College, University of Montreal, and others.

Source: Yakobson, Helen B., The Study of Russian in American High Schools, January 6, 1958.

The World's Languages

List issued by Modern Language Association, August 1956, and the number of American colleges and universities teaching them

Language	Native speakers	Number of institutions teaching	Language	Native speakers	Number of institutions teaching
	Millions			*Millions*	
Chinese (all dialects)	500	29	Hausa (Central Africa)	9	0
English	275	All(?)	Swedish	9	31
Hindi-Urdu	150	6	Czech	8	11
Russian	150	183	Pushtu (Afghanistan, Pakistan)	8	0
Spanish	145	867	Swahili (east Africa)	8	0
German	100	825	Bulgarian	7	7
Japanese	100	22	Madurese (Indonesia)	7	0
Malay (Bahasa Indonesia)	70	5	Sinhalese (Ceylon)	7	0
Bengali (India, Pakistan)	67	3	Amharic (Ethiopia)	6	0
Arabic	65	22	Catalan (Spain, France)	6	2
French	65	905	Uzbek (U. S. S. R.)	6	2
Portuguese	65	69	Assamese	5	0
Italian	50	212	Azerbaijani	5	1
Javanese	41	0	Flemish (Belgium)	5	0
Ukrainian	40	5	Kurdish	5	1
Bihari (India)	35	0	Mossi (west Africa)	5	0
Telegu (India)	33	1	Sindhi (India)	5	0
Korean	32	7	Tagalog (Philippines)	5	0
Polish	30	20	Tibetan	5	4
Tamil (India, Ceylon)	29	2	Yiddish	5	4
Marathi (India)	28	0	Danish	4	9
Punjabi (India, Pakistan)	25	1	Finnish	4	4
Turkish	22	8	Norwegian	4	20
Gujerati (India, Pakistan)	20	0	Armenian	3	3
Persian	20	8	Khmer (Cambodia)	3	0
Vietnamese	20	4	Lithuanian	3	2
Rajasthani (India, Pakistan)	17	0	Nepali (India)	3	0
Rumanian	17	7	Santali	3	0
Thai	16	3	Slovak	3	1
Dutch	15	6	Albanian	2	2
Kanarese (India)	15	0	Georgian (U. S. S. R.)	2	0
Serbocroatian	15	10	Gondi (India)	2	0
Burmese	13	2	Hebrew (modern)	2	5 plus (?)
Hungarian	13	5	Slovene	2	3
Lahnda (India, Pakistan)	13	0	Estonian	1	2
Malayalam (India)	13	0	Lettish	1	1
Oriya (India)	13	0	Mordvin	1	1
Sundanese (Indonesia)	13	0	Cheremis	----------	1
Byelorussian	12	0	Hawaiian	----------	1
Visayan (Philippines)	9	1	Lapp	----------	1
Greek (modern)	9	9	Romany	----------	1

OFFERINGS IN MODERN FOREIGN LANGUAGE STUDY IN THE PUBLIC SCHOOLS OF THIRTY-SIX COUNTRIES

Source: Parker, William R., The National Interest and Foreign Languages, revised edition, January 1957. p. 50.

Education of Language Teachers

training the language teacher

On this subject a book, a very sad book, could be written. Back in 1892 an NEA committee on the curriculum of the secondary school reported: "The worst obstacle to the progress of modern language study is the lack of properly equipped instructors." That statement is still true. There are other obstacles, but none more basic.

Those who determine policy in our public schools have, on the one hand, effectively objected to foreign language instruction because it is poorly done and achieves little in 2 years, and, on the other hand, have persistently required an insufficient minimum of foreign language training of the teachers actually hired. Unfortunately, no amount of work in how to teach will increase the fluency or improve the accent or reading knowledge of a foreign language teacher who has not studied languages long enough. In respect to the amount of training he needs in order to be barely adequate, he may or may not be (as some think he is) unique; but it is certain enough that his deficiencies will be readily apparent, and his teaching ineffectual, if he has had no more than the minimum amount of study presently required of him by the department of education in most of our States.

Such unpleasant generalizations need to be clarified and illustrated. They sound like bitter accusations instead of the statement of a complex truth which they are.

Part of the trouble has been the general tendency, remarked in a number of recent books and articles on American education, to require more and more college work in "professional education" and hence to minimize all traditional "subject matter" courses. For example, the Michigan State Board of Education a few years ago appointed a special committee to propose improvements in the teacher certification code. Its proposals (as of February 1954) required for B. A. and B. S. degrees with certificate "at least" 30 hours in professional education courses and "at least" 40 hours in "general education" (defined as "communication arts," social science, and science) with 15 of these in interdisciplinary courses. Nothing in the humanities was required, but the applicant for certification "may present" as much as 20 hours, in his "subject matter" field (e. g., foreign languages). The proposed code would, of course, require the compliance of all Michigan institutions, including private liberal arts colleges, that train teachers. The reader may figure out for himself how much French or Spanish or German the future teacher of these subjects in Michigan schools can know. As in many other States, he is presently required to have only a "minor" (15 semester hours of college work) in order to teach a foreign language.

To put this another way, in many States high school teachers of a foreign language are required to have a minimum of 225 "contact hours" of language instruction—as compared with the 612 or more hours in the wartime "intensive language program." A consequence of this policy is that the language teacher in a second-year high school class has often reached the practical limit of what he himself has been taught, his only advantage over the class being the number of times he has taught it. Little wonder that the 2-year course has come to be considered terminal in so many high schools.

Although the State requirements for the certification of language teachers have greatly improved in recent decades, they still leave much to be desired. At least 3 States (Maine, Utah, and Washington) still require no more than 2 years (or 10 or 12 semester hours) of college work. Most States require a college major or minor in the language to be taught, but the average number of semester hours in a minor is, as we have remarked, about 15. In an increasing number of cases the prospective teacher has not begun the language in high school, and there is a great difference between the minimum college preparation in languages and that in, say, English or mathematics or American history, fields in which the teacher has already a foundation of elementary training. Moreover, and most unhappily, because of the great shortage of teachers in recent years, State certifying boards have had to relax already low standards. It was estimated late in 1956, that 80,209 teachers were employed on substandard or emergency certificates (an increase of 10,000 over the 1953 figure).

Even in the States where the paper requirements for a teaching certificate are the highest (e. g., Georgia and North Carolina), the language teacher is rarely treated as an expert and a specialist in one subject. Except for the older teachers in the larger cities, it is very uncommon for a teacher to have classes

in only 1 subject, the great majority of high school teachers (perhaps 7 out of 10) having regularly to teach 2 and often 3 subjects. Much of their work therefore lies in the field of their college "minor." For example, a principal or a school board in a small town, having to hire a teacher for 2 classes of English, 2 of social sciences, and 2 of French, frequently finds it easiest to get a woman who majored in English, minored in some sort of social science, and had 2 years of French in high school and 1 in college. With the present shortage of teachers, the State board cannot insist upon anything better and the candidate is hired—with predictable results. Knowing she is poorly prepared in French and distracted by time-consuming extracurricular demands, she keeps up appearances for 2 or 3 years, the French enrollment drops below the economical minimum of 20 (the Army tried to hold language classes to a maximum of 8), the classes are abandoned, and the problem is solved.

The liberal arts colleges have contributed to this deplorable situation. No standard training syllabus for the foreign language teacher exists; on the contrary, there exists an extraordinary diversity of heterogeneous courses (usually with a literary emphasis) accepted for a language major or minor, but with little value as preparation for high school teaching. Ironically, teachers colleges with some exceptions (e. g., Columbia, Illinois, and Ohio State) are generally small institutions concerned with giving "professional education" courses, and are rarely staffed to give anything beyond elementary work in foreign languages when they teach languages at all.

For these reasons, the usual low statement of so many semester hours required for certification is practically meaningless. The 15 hours required by many States will seem better justified if the applicant is a graduate of, say, Cornell or Middlebury than if she offers 36 hours from some other institutions that might be named. But only 1 or 2 States (e. g., New York) and the District of Columbia as yet supplement the quantitative requirement with a qualifying oral and written examination.

Who is to blame for this state of affairs? Chiefly, it must be said, the American public. We have mistakenly blamed teaching methods, instead of coming to the heart of the matter, the teacher, and reviewing our own responsibility to education.

Today the average annual salary of a public schoolteacher is $3,816, with large numbers getting $2,050 (Mississippi) or less. A recent survey of teachers in St. Louis, found that only 8 percent of the male teachers supported themselves and their families by teaching alone. The Educational Testing Service recently reported that the men who are today preparing to be teachers are, as a group, the very poorest students of all those attending colleges and universities. Why? And what about the estimated shortage of half a million teachers by 1960? The problem of the low-standard foreign language teacher must be considered in this larger context.

Today, clearly, foreign-language study in America is in a transitional stage. If it is to receive more stress in our schools, the problems ahead are staggering. Precise figures are lacking, but there are probably about 11,000 modern foreign-language teachers in our colleges and universities, about 15,000 in our private and public secondary schools (approximately the same number as there were back in 1925, when total public school enrollments were considerably smaller.) Of these 26,000 teachers, many are inadequately trained, many overworked and underpaid. Only one-third of them, at the most, belong to any national organization that can give them a sense of being part of an active, unified profession, through an attendance at meetings, reading of pedagogical journals, work on committees, and other means of encountering new ideas.

Most of them feel depressed and frustrated a great deal of the time, for they are expected to do what they know will usually prove impossible and they are painfully aware of (and sometimes exaggerate) the hostility or indifference of administrative officers, other teachers, and part of the public. Few of them speak correctly and fluently the language they teach, for the simple reason that they were never taught to do so and they have lacked the means to visit the country they are supposed to know all about. They teach only what they feel competent to teach—and stop there. They know few of the historical or current facts that you are now reading.

Statisticians tell us that between now and 1970 we shall need, in American colleges and universities alone, approximately 8,500 additional (i. e., not including normal replacement) foreign-language teachers (between now and 1960, 1,900). These estimates derive from analysis of birth statistics for the 1930's and 1940's, and assume no change in the current appeal of language study. No one yet knows how these additional teachers are going to be recruited and

trained. If the American public insists upon and gets some emphasis upon foreign-language study in our colleges, the figures just given will, of course, have to be revised upward accordingly. We may hope, however, that many more young people will be attracted into foreign-language teaching if its academic position is improved and its importance publicly recognized.

Source: The National Interest and Foreign Languages, revised edition, January 1957.

Basic and minimum requirements in semester hours for authorization to teach foreign languages

	Basic requirements	Minimum requirements
Alabama	24	18
Alaska	16	12
Arizona	15	15
Arkansas	18	18
California	36	20
Colorado	12	----
Connecticut	18	18
18 semester hours for 1st foreign language; 12 semester hours for each additional language.		
Delaware	24	----
18 semester hours in each field if qualified for 2 foreign languages.		
District of Columbia	30	----
Florida	18	----
18 semester hours for 1st language; 12 semester hours for 2d language.		
Georgia	27	27
Hawaii	20	20
Idaho	15	15
Illinois	16	16
Indiana	42	42
In 2 languages.		
Iowa	15	12
Kansas	24	6
A 2d language may be taught with 15 semester hours in that field.		
Kentucky	42	18
18 semester hours in leading language; 12 semester hours in each of 2 other languages.		
Louisiana	24	24
24 semester hours in 1st language; 18 semester hours in 2d language.		
Maine	24	12
Maryland	18	18
Massachusetts	18	9
Michigan	15	----
Minnesota	24	15
Mississippi	18	18
Missouri	20	20
Montana	30	20
May be 1 language or a combination of 2. A composite of 3 must show 40 semester hours.		
Nebraska	15	12
Nevada	16	12
New Hampshire	18	6
New Jersey	18	18
New Mexico	15	10
New York	24	18
North Carolina	30	----
North Dakota	30	15
Ohio	----	20
Oklahoma	24	16
Oregon	20	20
20 semester hours for each language taught.		
Pennsylvania	18	18
Puerto Rico	30	30
Rhode Island	15	15
South Carolina	24	24
South Dakota	15	15
Tennessee	24	24
Texas	36	24
Utah	20	12
Vermont	24	12
Virginia	18	18
Washington	(1)	(2)
Major or minor in language at accredited institutions.		
West Virginia	24	15
Wisconsin	15	15
Wyoming	24	6

[1] Major.
[2] Minor.

NOTE.—A few States allow some credit toward certificate requirement for language studied in high school.

LANGUAGE TEACHER SHORTAGE

Shortage: In September 1956 the national supply of new high-school teachers of foreign languages was 25.4 percent short of the demand. In 32 States surveyed, colleges had turned out in the spring of 1956 a total of 639 graduates with qualifications for foreign language teaching in high schools. But only 397 (62 percent) actually went into teaching; the others went on to graduate work (10.5 percent), to homemaking (6.6 percent), to other gainful employment (5.9 percent), to military service (3.1 percent), etc. School principals were looking for 532 recruits qualified to teach as a major assignment a foreign language (i. e., some modern foreign language or Latin). But 135 principles ended their quest in disappointment. In September 1957 the supply of potential foreign language teachers was expected to be a scant 7 percent greater than in 1956, but 30.5 percent less than in 1950. We learned these facts after close study of the 1957 Teacher Supply and Demand Report, by Ray C. Maul (Journal of Teacher Education, March 1957). The report does not draw the conclusion that there was a 25.4 percent shortage of foreign language teachers, but the raw statistics are there and putting them together was a simple matter of arithmetic. A letter from Dr. Maul verifies this interpretation: "You are correct in every respect." A few more facts about the nature of the demand will prove useful. Of the 532 positions for teachers with major preparation in a foreign language, 320 were for full-time teaching of 1 foreign language or for teaching a second foreign language as a minor assignment; 128 required a minor teaching assignment in English; 50, in social studies; and the next most frequent minor was in home economics, 9. On the other hand, there was also considerable demand for new teachers whose chief assignments would be in other subjects but who would need minor teaching assignments in foreign languages. Among the popular combinations were: English, 262, with foreign languages as minor assignments; social studies, 35; home economics, 19; commerce, 11; and mathematics, 10.

Source: PMLA, Foreign Language Program Notes, September 1957.

Shortage: In 1955, 56.4 percent of the Nation's public high schools did not offer a modern foreign language, and 46 percent offered neither a modern foreign language nor Latin. Are these schools unwilling to teach foreign languages? Here's what Dr. Minnie M. Miller (Kansas State Teachers College, Emporia) discovered last winter when she sent a questionnaire to every Kansas high school without foreign language offerings. Principals at 32 schools replied that they would add Spanish if they could get a qualified teacher; 18 would add Latin or Spanish; 16, Latin; 3, French; 1, German; and 17 would add any language for which they could get a teacher.

Writes Dr. Miller: "Kansas appears then to be short 87 qualified teachers of foreign languages, mostly those who would also teach English. These schools are, for the most part, small; but the difficulty the larger schools are having now finding qualified people to replace teachers who resign makes the situation even more critical."

Source: PMLA, Foreign Language Program Notes, September 1957.

Shortage: Here's what the supply-and-demand picture was like at the College of Education of Ohio State University (as reported in the January 1956 Educational Research Bulletin). In 1956 the college graduated 16 foreign language majors: 7 in Spanish, 7 in French, 2 in German, none in Latin. This group had plenty of positions from which to choose. The division of appointments at Ohio State had received 213 calls (about half from outside the State) for persons with teaching majors in a foreign language—100 more requests than in 1955. The breakdown was: Latin, 78 calls (20 as a single subject, 58 combined with some minor subject); Spanish, 74 calls (8 as a single subject, 66 combined with a minor); French, 47 calls (4 as a single subject, 43 combined with a minor); and German, 14 calls (all combined with a minor). English was the most frequent minor requested in combination with each foreign language.

Source: PMLA, Foreign Language Program Notes, September 1957.

Mr. DERTHICK. Mr. Chairman, again to save the time of the committee, because we believe that we have registered the essential points on the foreign language instruction, I would next go to the expansion of graduate education, if I may, unless there are some questions.

Mr. ELLIOTT. Do you have any questions, Mrs. Green?

Mrs. GREEN. The only question I would have is with regard to your emphasis on science and languages. I take it you are making these recommendations to catch up with the Russians because there is an emergency at the present time. Is that right?

Mr. DERTHICK. No; that isn't the only reason. That is one consideration, Mrs. Green, but, all things considered, our present judgment and experience indicate that our curriculum is out of balance at the expense of mathematics and science and foreign languages, and we think, regardless of the Russians, that these measures need to be taken to bring it back into balance, although the Russian situation gives great emphasis to this need.

Mrs. GREEN. If we didn't have the situation now and the competition between the two powers, are these the kind of recommendations you would make for a long-range educational program for the United States?

Mr. DERTHICK. Our point of view is this:

Some of us have been worrying about the foreign language situation for some years, and the Russian situation only gives us a hearing, where we couldn't attract much attention before. It has been something that has disturbed us deeply because our people need to understand the age in which we live, and they need to communicate with other people in the world. And that applies to this area of mathematics and science.

Mrs. GREEN. Would you recommend this kind of a program in mathematics and science, or just kind of an overall educational program for the long haul?

Mr. DERTHICK. Yes; I would. I really would.

Mrs. GREEN. You think that kind of emphasis should be put on science and the math, and ignore other fields?

Mr. DERTHICK. No, Mrs. Green. I am glad you added those last words "ignore other fields" because I would not put mathematics and science ahead of English, for example, or history. I think that these basic subjects are all important. But I have come to realize, through the various studies and reports that have been made, that we have let math and science slip by the wayside until they do not have the place in the curricula that English does, for example. And I think that is bad.

I think that we need to take these measures to restore the balance, and, in the process of restoring the balance, I would put great emphasis upon the State and local authorities to see that we don't get out of balance in other fields as we try to bring these back in balance. I am very insistent and particular about that.

Mrs. GREEN. Then I come back to my original question: This is the kind of a recommendation you would make for an educational program over a long period of time, regardless of the emergency? This you think is a well-rounded program which would meet the needs and the demands of the American people over, say, the next 50 years?

Mr. DERTHICK. Well, Mrs. Green, I would have to acknowledge that, the national interest being what we conceive it to be, we take a more urgent view of the situation in mathematics and science than we would

otherwise. However, as a local school administrator, I would want to take measures continuously.

There was an old colored preacher down in our community that had this prayer:

> O Lord, prop us on our leaning sides.

And I think we also have our leaning sides, and I would hope, as a local school administrator, I would want to bring strength wherever there was weakness.

However, I must not overlook the national interest at the present time. I cite again Dr. Killian's testimony a year and a half ago before sputnik ever came along, and I repeat that Dr. Killian is deeply concerned. And one can go on his campus and see the practical application of that concern in maintaining a balanced curriculum. He would not put an overemphasis on the fields of mathematics and science, but I think he, like the rest of us—and in his testimony a year and a half ago—said we are in danger of becoming a Nation of mathematical illiterates, at a time when that is an essential ingredient of the kind of age in which we live.

Mrs. GREEN. However, if there is this emergency and if the national interest is to be our primary concern, isn't it true that many of the recommendations you have made here are not in reality going to meet that national emergency?

You cannot start giving mathematics and science to high school kids and expect to turn out scientists in time to compete with the Russians if there is an emergency.

Aren't we going to have to somehow devise a plan to make better use of the manpower which we now have?

Maybe I am wrong, but I am told that scientists in various industries are not being used to their full capacity, and that that is the problem, to try to get the people who are now prepared or who would be at the graduate level and whom we could really do something with to meet the present emergency.

Mr. DERTHICK. I am aware of the fact that you have become extremely well informed about this whole problem. I recall that you just had come back from this New Haven conference, and certainly there is great merit in what you say.

We do not regard this as a crash program, however. You just cannot have a crash program, as you imply, in education.

Our best information is that, insofar as the national interest is concerned as of this moment, we are not in grave danger, but unless we take strong measures we might be in danger 10 to 15 years from now.

I just had a reference here that was basic to the remark that I made: from top advisers and from the highest sources we have been given to understand that it is a question of where we are going to be 10 to 15 years from now, rather than where we are going to be next year, because, as you have correctly pointed out and suggested, it takes longer than a year to make a scientist.

Mrs. GREEN. Then your recommendations are made with that in mind—where we are going to be 10 or 15 years from now rather than trying to compete with the Russians as of next year or a year after?

Mr. DERTHICK. That is right; as of next year.

Mrs. GREEN. That is all, Mr. Chairman.

Mr. ELLIOTT. You may proceed, Mr. Commissioner.

Mr. DERTHICK. Then I go, Mr. Chairman, to the expansion of graduate education.

Title VI of the bill contains the recommended provisions for expansion of graduate programs to increase the available numbers of highly trained individuals, from which we must draw our supply of fully qualified college teachers.

Attention has been called repeatedly to the critical shortage of first-rate teachers in this country today. The need is great at all levels of education, and it is becoming increasingly pressing in the institutions of higher education. The colleges and universities will soon be flooded with students far beyond their present numbers, and they will therefore require greatly increased numbers of teachers.

It will take more of an effort to find and train these teachers than is generally realized because today the graduate schools of our universities award annually somewhat less than 9,000 doctoral degrees. This degree represents the desired and standard preparation for teaching in college. It is to be hoped that in the years ahead more students will receive it, but present trends are not reassuring. The output has been almost at a standstill for a number of years.

Here I want to say a word about the qualifications of new full-time college teachers. Recent studies indicate a deterioration in these qualifications. For example, in 1953–54, 40 percent of all college teachers held doctoral degrees, but in this same year only 31 percent of the new college teachers had such degrees. Three years later the latter figure had dropped to 23 percent, which represents a serious loss indeed.

The quality of new full-time college teachers is uneven as between the different subject matter fields. The deterioration is felt more severely in fields with which the Nation is now much concerned—physical science, mathematics, and engineering. In these the percentages of new full-time college teachers with the doctorate declined in 3 years by 18 percent, 40 percent, and 30 percent, respectively.

Many of the graduate schools have few students because the schools do not have the resources to instruct larger numbers. Graduate education is costly. It requires extensive and costly library and laboratory facilities. The direction of graduate students is largely on an individual basis, which means that the ratio of teachers to students is necessarily high. Moreover, many graduate students have families for whom living accommodations must be made available. This heavy cost limits the number of universities that can offer acceptable opportunities for graduate study.

Consequently, today there are only some 163 institutions out of a national total of 1,856 that confer doctoral degrees based on graduate instruction. Sixty-nine of these are under public control and 94 are under private control. In the year 1955–56, 60 institutions each conferred fewer than 10 doctoral degrees, and 103 conferred 10 or more. Only a few—27 to be exact—awarded more than 100 such degrees. It appears, therefore, that a considerable potential exists for increasing the output of our graduate schools.

The present proposal, which provides for grants to institutions and for fellowships to graduate students, is, I believe, one way to turn the tide which is running against higher education.

The bill would authorize grants to institutions of higher education to expand existing programs of graduate education and to initiate new programs. These grants could not exceed 50 percent of the costs of this expansion, and they could be used for additional or increased faculty salaries and other costs, including overhead and equipment attributable to the expanded or new programs. Under our proposal, no institution would receive an annual grant in excess of $125,000.

The bill would require that preference in awarding the fellowships would be given to students who are interested in teaching in institutions of higher education.

Then I have for the record, Mr. Chairman, some supplementary material that I would like to insert.

Mr. ELLIOTT. Without objection, the insertion will be made at this point.

(The material referred to follows:)

SUPPLEMENTAL STATEMENT OF LAWRENCE G. DERTHICK, COMMISSIONER OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Summary of Supplemental Material Relating to the Expansion of Graduate Education Under Title IV, Expansion of Graduate Education, H. R. 10279

1. Figure I shows how the percentages of college teachers holding doctors' degrees have decreased in recent years; this is particularly reflected in the percentages of new teachers holding such degrees. There has been an increase in the percentage who hold less than masters' degrees.

2. Figure II shows that the number of persons receiving doctors' degrees reached a peak in 1954 and that since that time there has been a decrease in the number of these degrees awarded.

3. Table I lists the colleges and universities that conferred earned doctors' degrees in 1955–56, named in descending order of the number of degrees conferred.

4. Table 2, based on the data of table I, shows that 27 institutions each conferred 100 or more doctors' degrees in 1955–56 and that they conferred 5,703 such degrees or about 64 percent of the total number of such degrees. It shows also that a sizable number of institutions confer only a few of these degrees.

5. Table 3 shows the distribution by States of the doctors' degrees conferred in 1955–56.

6. Figure III, like table 3, indicates the geographical distribution of the doctors' degrees conferred in 1955–56.

7. Figure IV indicates the distribution of the graduate enrollment in November 1953 and shows that it tends to be concentrated in a few areas.

8. Table 4 shows the financial assistance to graduate students which was provided through institutions of higher education in 1955–56.

9. Where do doctors' degree candidates go? This shows that not more than about 3,500 persons receiving doctors' degrees in a year go into educational work such as teaching (including research) and administration.

10. Federal support of graduate students. This shows the forms of assistance provided by the Federal Government for graduate students.

11. Private fellowships for teachers. This statement describes briefly two fairly substantial private fellowship programs for those who are college teachers or who are preparing to become college teachers.

FIGURE I

PERCENT OF FULL-TIME TEACHING STAFF AT HIGH AND LOW LEVELS OF PREPARATION (1953-54), COMPARED WITH NEW FULL-TIME TEACHERS EMPLOYED IN 1953-54, 1954-55, 1955-56, AND 1956-57

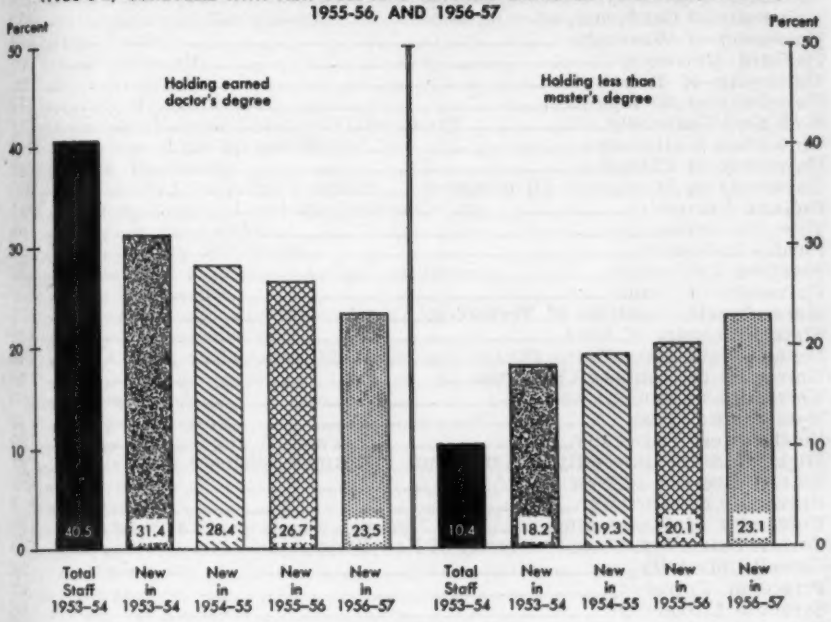


FIGURE II

TOTAL NUMBER OF DOCTOR'S DEGREE GRADUATES, BY SEX, 1938 TO 1948 BIENNIALLY, AND 1948 TO 1956 ANNUALLY (IN HUNDREDS)

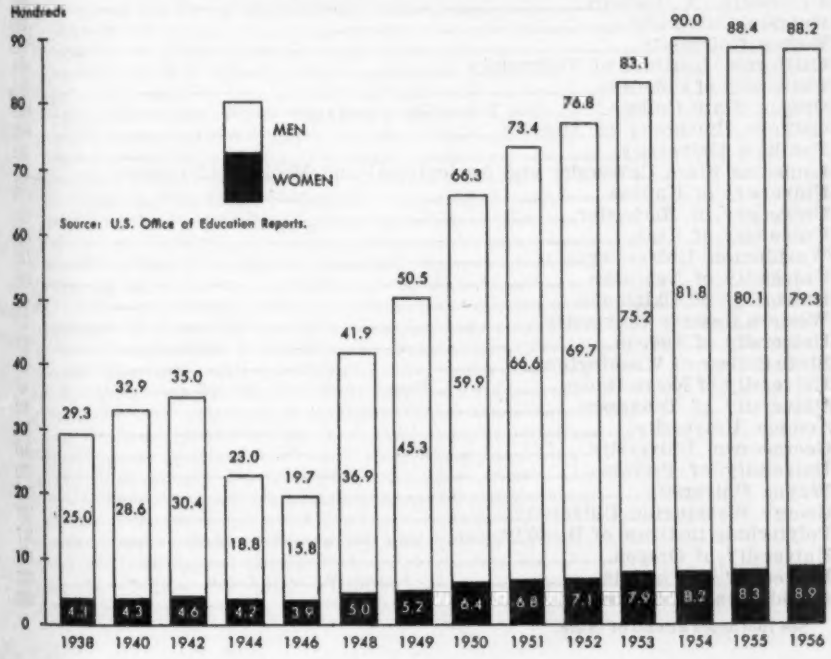


TABLE I.—*Number of earned doctorates, 1955–56*

Name of institution	*Number*
Columbia University	526
University of California, all campuses	452
University of Wisconsin	349
Harvard University	298
University of Illinois	291
University of Michigan	274
New York University	271
Ohio State University	243
University of Chicago	241
University of Minnesota, all campuses	230
Indiana University	221
Yale University	198
Purdue University	196
Stanford University	187
University of Texas	159
Massachusetts Institute of Technology	157
State University of Iowa	152
Pennsylvania State University	149
University of Southern California	146
University of Pennsylvania	135
Iowa State College	132
Northwestern University	125
Michigan State University of Agriculture and Applied Science	121
State University of New York [1]	118
University of Pittsburgh	113
University of Washington	110
Cornell University, State University of New York	109
Cornell University	98
Princeton University	97
Syracuse University	96
University of North Carolina, Chapel Hill	95
Johns Hopkins University	88
Duke University	85
University of Florida	83
University of Maryland	78
University of Missouri	77
Rutgers University	76
Boston University	72
California Institute of Technology	69
University of Colorado	69
Oregon State College	68
Catholic University of America	63
Fordham University	59
Louisiana State University and Agricultural and Mechanical College	57
University of Kansas	56
University of Rochester	53
University of Utah	52
Washington University	52
University of Nebraska	50
University of Oklahoma	48
Western Reserve University	48
University of Denver	47
State College of Washington	44
University of Notre Dame	42
University of Tennessee	42
Temple University	41
Georgetown University	40
University of Buffalo	40
Wayne University	38
George Washington University	37
Polytechnic Institute of Brooklyn	37
University of Oregon	37
University of Virginia	37
Florida State University	36

See footnotes at end of table.

TABLE I.—*Number of earned doctorates, 1955–56*—Continued

Name of institution	*Number*
Carnegie Institute of Technology	35
Illinois Institute of Technology	35
Radcliffe College	35
St. Louis University	35
Brown University	34
University of Kentucky	32
Southwestern Baptist Theological Seminary[2]	31
Staley College of the Spoken Word[2]	31
Vanderbilt University	30
George Peabody College for Teachers	28
Oklahoma Agricultural and Mechanical College	28
University of Connecticut	28
Tulane University of Louisiana	27
Agricultural and Mechanical College of Texas	26
American University	25
Colorado State College of Education	24
University of Delaware	24
University of North Carolina, State College, Raleigh	24
University of Cincinnati	23
Kansas State College	21
University of Houston	21
Rensselaer Polytechnic Institute	18
Case Institute of Technology	17
Clark University	17
Rice Institute	17
Southern Baptist Theological Seminary[2]	17
Lehigh University	16
Loyola University	16
Tufts University	15
University of Alabama	15
Virginia Polytechnic Institute	13
New Orleans Baptist Theological Seminary[2]	12
St. John's University, New York	12
University of Arkansas	12
University of Wyoming	11
New School for Social Research	10
St. Mary's College	10
University of Massachusetts	10
University of New Mexico	10
Bradley University	9
College of Forestry, State University of New York	9
Dallas Theological Seminary[2]	9
Emory University	9
Union Theological Seminary	9
Utah State Agricultural College	9
West Virginia University	9
Bryn Mawr College	8
Dropsie College[2]	8
University of Arizona	8
University of Georgia	8
University of North Dakota	8
Alabama Polytechnic Institute	7
Georgia Institute of Technology	7
Northern Baptist Theological Seminary[2]	7
Springfield College	7
Texas Technological College	7
University of South Carolina	7
Hartford Seminary Foundation[2]	6
Drew University	5
Lawrence College	5
Pennsylvania College of Pharmacy and Science	5
Princeton Theological Seminary[2]	5
Union Theological Seminary, Virginia[2]	5

See footnote at end of table.

TABLE I.—*Number of earned doctorates, 1955–56*—Continued

Name of institution	*Number*
Baylor University	4
Bob Jones University [2]	4
Claremont Graduate School	4
Colorado School of Mines	4
Iliff School of Theology [2]	4
Jefferson Medical College	4
Medical College of Virginia	4
University of Mississippi	4
Yeshiva University	4
Adelphia College	3
Arizona State College (Tempe)	3
College of the Pacific	3
Jewish Theological Seminary of America [2]	3
Middlebury College	3
Texas State College for Women	3
University of Louisville	3
University of Tulsa	3
Brooklyn Law School, New York [2]	2
Chicago Lutheran Theological Seminary [2]	2
Concordia Seminary, Missouri [2]	2
General Theological Seminary, New York [2]	2
Grace Theological Seminary [2]	2
Hebrew Union College, Jewish Institute of Religion [2]	2
Medical College of South Carolina	2
Montana State College	2
Pacific School of Religion	2
St. Mary of the Lake Seminary [2]	2
University of Portland	2
Duquesne University	1
Golden Gate Baptist Theological Seminary [2]	1
Hahnemann Medical College	1
New Mexico Institute of Mining and Technology	1
North Texas State College	1
Stevens Institute of Technology	1
Union College and University [2]	1
Western Theological Seminary [2]	1

[1] Includes also degrees listed separately for "Cornell University, State University of New York," and "State University of New York College of Forestry."
[2] Separately organized professional school of law, religion, speech, or theology.

Source: Department of Health, Education, and Welfare, Office of Education, earned degree study.

TABLE 2.—*Distribution table—Number of earned doctorates 1955–56*

	Number of institutions granting them
Number of degrees granted:	
500–526	1
400–452	1
300–349	1
290–299	2
280–289	0
270–279	2
260–269	0
250–259	0
240–249	2
230–239	1
220–229	1
210–219	0
200–209	0
190–199	2
180–189	1
170–179	0
160–169	0
150–159	3
140–149	2
130–139	2
120–129	2
110–119	3
100–109	1
90–99	4
80–89	3
70–79	4
60–69	4
50–59	7
40–49	9
30–39	15
20–29	12
10–19	18
1–9	60
Total	163

TABLE 3.—*Distribution of institutions granting earned doctorates, 1955–56, by States*

Name of institution	*Number*
Alabama:	
Alabama Polytechnic Institute	7
University of Alabama	15
Arizona:	
Arizona State College (Tempe)	3
University of Arizona	8
Arkansas: University of Arkansas	12
California:	
California Institute of Technology	69
Claremont Graduate School	4
College of the Pacific	3
Golden Gate Baptist Theological Seminary [1]	1
Pacific School of Religion [1]	2
Stanford University	187
University of California (all campuses)	452
University of Southern California	146
Colorado:	
Colorado School of Mines	4
Colorado State College of Education	24
Iliff School of Theology [1]	4
University of Colorado	69
University of Denver	47
Connecticut:	
Hartford Seminary Foundation [1]	6
University of Connecticut	28
Yale University	198
Delaware: University of Delaware	24
Florida:	
Florida State University	36
University of Florida	83
Georgia:	
Emory University	9
Georgia Institute of Technology	7
University of Georgia	8
Idaho	0
Illinois:	
Bradley University	9
Chicago Lutheran Theological Seminary [1]	2
Illinois Institute of Technology	35
Loyola University	16
Northern Baptist Theological Seminary [1]	7
Northwestern University	125
St. Mary of the Lake Seminary [1]	2
University of Chicago	241
University of Illinois	291
Indiana:	
Grace Theological Seminary [1]	2
Indiana University	221
Purdue University	196
St. Mary's College	10
University of Notre Dame	42
Iowa:	
Iowa State College	132
State University of Iowa	152
Kansas:	
Kansas State College	21
University of Kansas	56
Kentucky:	
Southern Baptist Theological Seminary [1]	17
University of Kentucky	32
University of Louisville	3

See footnotes at end of table.

TABLE 3.—*Distribution of institutions granting earned doctorates, 1955–56, by States*—Continued

Name of institution	*Number*
Louisiana:	
Louisiana State University and Agricultural and Mechanical college	57
New Orleans Baptist Theological Seminary [1]	12
Tulane University of Louisiana	27
Maine	0
Maryland:	
Johns Hopkins University	88
University of Maryland	78
Massachusetts:	
Boston University	72
Clark University	17
Harvard University	298
Massachusetts Institute of Technology	157
Radcliffe College	35
Springfield College	7
Staley College of the Spoken Word [1]	31
Tufts University	15
University of Massachusetts	10
Michigan:	
Michigan State University of Agriculture and Applied Science	121
University of Michigan	274
Wayne University	38
Minnesota: University of Minnesota, all campuses	230
Mississippi: University of Mississippi	4
Missouri:	
Concordia Seminary [1]	2
St. Louis University	35
University of Missouri	77
Washington University	52
Montana: Montana State College	2
Nebraska: University of Nebraska	50
Nevada	0
New Hampshire	0
New Jersey:	
Drew University	5
Princeton Theological Seminary [1]	5
Princeton University	97
Rutgers University	76
Stevens Institute of Technology	1
New Mexico:	
New Mexico Institute of Mining and Technology	1
University of New Mexico	10
New York:	
Adelphia College	3
Brooklyn Law School [1]	2
Columbia University	526
Cornell University	98
Cornell University, State University of New York	109
Fordham University	59
General Theological Seminary [1]	2
Jewish Theological Seminary of America [1]	3
New School for Social Research	10
New York University	271
Polytechnic Institute of Brooklyn	37
Rensselaer Polytechnic Institute	18
St. John's University	12
State University of New York [2]	118
College of Forestry, State University of New York	9
Syracuse University	96
Union College and University [1]	1
Union Theological Seminary	9

See footnotes at end of table.

TABLE 3.—*Distribution of institutions granting earned doctorates, 1955–56, by States*—Continued

Name of institution	*Number*
New York—Continued	
University of Buffalo	40
University of Rochester	53
Yeshiva University	4
North Carolina:	
Duke University	85
University of North Carolina, Chapel Hill	95
University of North Carolina, State College, Raleigh	24
North Dakota: University of North Dakota	8
Ohio:	
Case Institute of Technology	17
Hebrew Union College, Jewish Institute of Religion [1]	2
Ohio State University	243
University of Cincinnati	23
Western Reserve University	48
Oklahoma:	
Oklahoma Agricultural and Mechanical College	28
University of Oklahoma	48
University of Tulsa	3
Oregon:	
Oregon State College	68
University of Oregon	37
University of Portland	2
Pennsylvania:	
Bryn Mawr College	8
Carnegie Institute of Technology	35
Dropsie College [1]	8
Duquesne University	1
Hahnemann Medical College	1
Jefferson Medical College	4
Lehigh University	16
Pennsylvania State University	149
Philadelphia College of Pharmacy and Science	5
Temple University	41
University of Pennsylvania	135
University of Pittsburgh	113
Western Theological Seminary [1]	1
Rhode Island: Brown University	34
South Carolina:	
Bob Jones University [1]	4
Medical College of South Carolina	2
University of South Carolina	7
South Dakota	0
Tennessee:	
George Peabody College for Teachers	28
University of Tennessee	42
Vanderbilt University	30
Texas:	
Agricultural and Mechanical College of Texas	26
Baylor University	4
Dallas Theological Seminary [1]	9
North Texas State College	1
Rice Institute	17
Southwestern Baptist Theological Seminary [1]	31
Texas State College for Women	3
Texas Technological College	7
University of Houston	21
University of Texas	159
Utah:	
University of Utah	52
Utah State Agricultural College	9

See footnotes at end of table.

TABLE 3.—*Distribution of institutions granting earned doctorates, 1955–56, by States*—Continued

Name of institution	*Number*
Vermont: Middlebury College	3
Virginia:	
Medical College of Virginia	4
Union Theological Seminary [1]	5
Universary of Virginia	37
Virginia Polytechnic Institute	13
Washington:	
State College of Washington	44
University of Washington	110
West Virginia: West Virginia University	9
Wisconsin:	
Lawrence College	5
University of Wisconsin	349
Wyoming: University of Wyoming	11
District of Columbia:	
American University	25
Catholic University of America	63
Georgetown University	40
George Washington University	37

[1] Separately organized professional school of law, religion, speech, or theology.
[2] Includes also degrees listed separately for "Cornell University, State University of New York," and "State University of New York College of Forestry."

Source: Department of Health, Education, and Welfare, Office of Education, Earned Degree Study.

FIGURE III

Distribution of Earned Doctoral Degrees (Ph.D. and Equivalent)
Conferred by Higher Education Institutions, 1955-1956

Alaska - None
Hawaii - None
Puerto Rico - None
U.S. Service Schools - None
United States, Aggregate - 8,903

FIGURE IV

GRADUATE ENROLLMENT BY STATE

November 1953

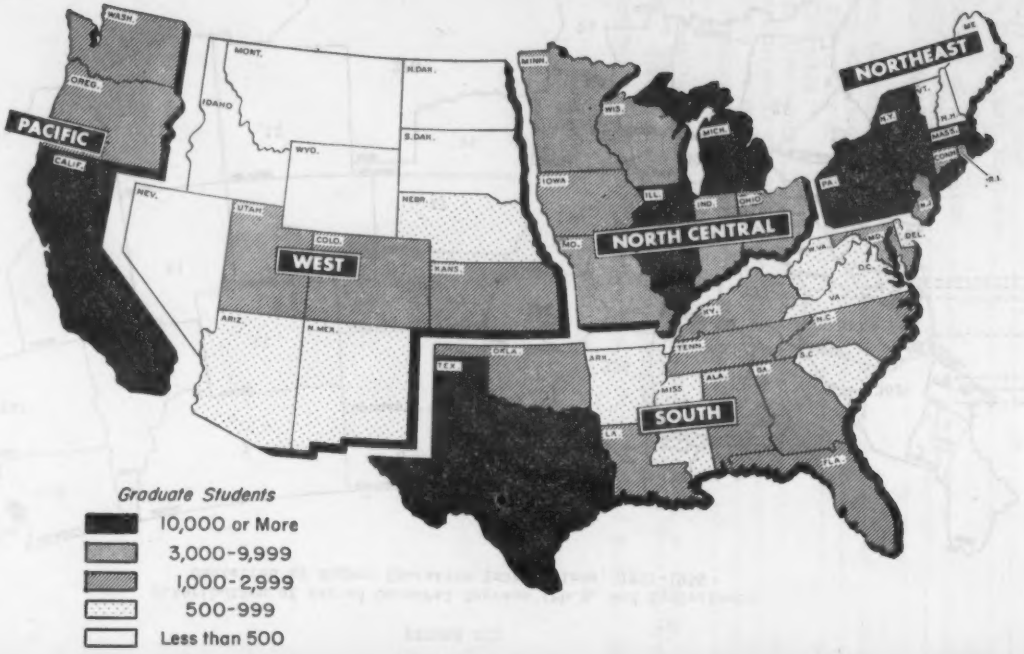


TABLE 4.—*Summary of institutional fellowships, loans, and assistantships for graduate students in institutions of higher education by States, 1955–56 (listed by States in which the institutions are located)*

State or Territory	Number of institutions	Fellowships		Loans [1]		Assistantships [2]	
		Number	Amount	Number	Amount	Number	Amount
1	2	3	4	5	6	7	8
Total	406	24,885	$18,239,150	30,507	$4,986,742	29,406	$35,007,789
Alabama	3	157	117,685	7	1,930	127	99,840
Alaska	1	1	170			3	3,600
Arizona	2	135	45,625			98	119,560
Arkansas	2	22	8,070	50	6,285	117	94,770
California	30	1,252	1,151,815	3,407	559,625	2,632	2,762,325
Colorado	8	215	181,420	4,111	722,360	202	153,015
Connecticut	9	643	655,555	86	27,090	194	286,855
Delaware	1	118	207,090			42	80,430
District of Columbia	6	356	176,530	296	102,120	94	75,795
Florida	4	411	259,505	3,481	261,925	988	821,540
Georgia	4	246	181,850	217	67,045	121	80,465
Hawaii	1	1	5,000			75	81,375
Idaho	1	6	5,730	3	300	56	89,320
Illinois	27	2,218	1,539,190	2,842	557,636	2,468	3,483,360
Indiana	11	455	604,075	1,393	154,700	2,159	2,586,480
Iowa	4	1,407	335,825	1,019	100,955	582	772,575
Kansas	8	199	216,680	541	91,390	224	282,225
Kentucky	8	387	157,060	346	40,195	117	144,000
Louisiana	2	728	217,935	19	8,970	463	525,230
Maine	2	16	7,130			46	67,620
Maryland	5	543	447,995	35	11,375	671	1,081,200
Massachusetts	29	2,914	2,003,520	1,261	606,625	1,440	726,020
Michigan	10	1,047	925,045	1,209	282,275	1,764	2,055,360
Minnesota	5	830	1,595,456	216	27,480	1,082	1,518,230
Mississippi	3	39	23,255			70	57,000
Missouri	12	407	215,950	127	36,180	483	594,800
Montana	3	70	20,580	15	2,175	91	111,750
Nebraska	2	132	125,770	102	17,020	318	305,280
Nevada	1	2	4,000			11	12,430
New Hampshire	3	30	15,630	32	9,120	54	81,000
New Jersey	11	454	598,918	72	13,665	376	604,140
New Mexico	6	59	47,875	88	8,080	85	104,460
New York	44	3,436	2,437,560	402	151,230	2,078	3,990,840
North Carolina	8	139	186,100	536	166,560	708	973,450
North Dakota	2	55	10,460	2	550	46	52,230
Ohio	18	626	627,291	144	24,830	1,164	1,928,815
Oklahoma	6	204	72,215	881	142,115	489	646,715
Oregon	7	54	29,970	397	35,970	322	340,530
Pennsylvania	23	1,627	823,115	75	34,660	1,341	1,853,130
Puerto Rico	1	30	42,000				
Rhode Island	3	102	122,565	11	2,145	32	40,480
South Carolina	8	107	108,695	261	32,944	174	107,829
South Dakota	3	37	34,780			73	94,540
Tennessee	7	525	221,645	518	76,870	351	344,195
Texas	21	734	426,375	3,662	273,840	2,081	1,026,320
Utah	3	84	58,975	46	9,430	578	613,045
Vermont	4	14	10,800	293	65,605	39	57,360
Virginia	9	157	191,175	65	20,375	203	194,260
Washington	7	105	82,345	1,265	130,662	759	969,970
West Virginia	2	28	33,570	76	5,320	80	92,400
Wisconsin	5	1,304	607,470	861	90,825	1,579	1,763,910
Wyoming	1	17	14,110	37	6,290	56	55,720

[1] Includes loans to 23,819 students in the amount of $3,315,002, reported to the Office of Education as "undergraduate and graduate."

[2] Includes 4,837 assistantships valued at $4,867,845, which were reported as "undergraduate and graduate" by 6 universities.

WHERE DO DOCTOR'S DEGREE GRADUATES GO?

The number of doctor's degrees conferred in a given year is not a true measure of the number of such persons to become newly available for employment. The gross number must be reduced by one-third because 1 in 3 of all doctor's degree recipients has already fully committed himself to an occupation prior to the year of his graduation, and does not change his occupation as a consequence of attaining doctoral status. If, as was the case in 1955, the total number pro-

duced by the graduate schools is approximately 9,000, the employer of college teachers should anticipate the reservoir of new potential supply to be not more than 6,000.

But the employing officers' handicap does not end there. Of this remaining 6,000, about 1 in 3 will enter a noneducational occupation, and the remaining new supply will thus be reduced to 4,000. And even within this group the employer of college teachers must be prepared to see 1 of every 9 enter the service of a school system or an educational agency or association. Finally, then, the original class of 9,000 doctor's degree graduates may be expected to profit the colleges and universities by not more than about 3,500 persons in the combined fields of teaching, administration, and research.

FEDERAL SUPPORT OF GRADUATE STUDENTS

In 1954, the latest year for which we have figures, the Federal Government supported somewhat in excess of 1 out of every 5 graduate students. This means that nearly 43,000 graduate students received Federal support, at a cost of over $50 million. The sources of this support were:

Veterans' educational benefits.—27,000 graduate students, more than three-fifths of the total number receiving Federal support, received payments totaling $24,725,000. There was no sharp restriction of field in this program.

Research assistantships.—More than 5,900 graduate students were employed as research assistants on Federal contracts and grants, receiving a total of $10,812,000. The unevenness of this support by field is indicated by the fact that 97 plus percent were in the natural sciences, and less than 2 percent in the social sciences and nonscience fields. The largest part of this support was provided by research contracts of the military departments. Other agencies providing substantial support were the Department of Health, Education, and Welfare, the Atomic Energy Commission, the Department of Agriculture, and the National Science Foundation.

Fellowships.—1,560 graduate students in all fields of study received $4,766,000 in fellowship aid. The National Science Foundation financed 498 graduate fellows and 24 postdoctoral fellows at a cost of $1,320,000.

The Department of Health, Education, and Welfare financed 46 graduate fellows and 444 postdoctorial fellows at a cost of $2,132,000.

The Atomic Energy Commission financed 90 predoctoral fellows and 8 postdoctoral fellows at a cost of $335,000.

The Fulbright program financed nearly 1,100 graduate and postdoctoral fellows at a total cost of $4,299,000 in Fulbright payments.

Traineeships.—The traineeship program of the Veterans' Administration and the National Institutes of Health financed the study of 1,600 graduate students in psychology and related paramedical fields, at a cost of $3,672,000.

Proportion of graduate students receiving Federal support: Natural sciences 28 percent, social sciences 8 percent, and nonsciences 16 percent.

Conclusion

Important in connection with title IV of the bill presently before Congress is the fact that the most substantial support for graduate education to date has come from a source that is drying up, namely, veterans' educational benefits.

A critical problem posed by the current pattern of support is that with the decline in support of graduate students through veterans' educational benefits, the support by the Federal Government tends to be for vocational, scientific, and technological endeavor, and not for the general types of support provided by veterans' educational program. Many lay and professional people view with alarm programs that direct study and students into certain fields to the exclusion or neglect of others.

George Boas reminds us that while the historian, the linguist, and the philosopher are not essential to defense they are "merely essential to civilization."

F. G. Friedmann, speaking for a great many, says "As to the problem of survival of our Western World, recent history seems to teach that our failures were due to lack of understanding of the human factor rather than to our shortcomings in the technological field * * * An increased emphasis on relevant training and research in the humanities and the social sciences seems therefore to be called for."

PRIVATE FELLOWSHIPS FOR TEACHERS

Two systems of fellowships aimed at assisting persons who prepare to teach in colleges should be mentioned. One operates on a nationwide scale, the other on a regional scale.

Woodrow Wilson fellowships

The Woodrow Wilson fellowship program was established at Princeton University in 1945. In 1952 it came under the more general sponsorship of the Association of Graduate Schools and after that time the fellowships were underwritten by generous grants from the Carnegie Corp. and the General Education Board. A significant grant from the Ford Foundation in 1957 made it possible to increase the fellowships to as many as 1,000 a year for the next 5 years.

The awards are expected to average $2,200. Nominations are made by local faculty members; selection is made by regional committees and a national committee. Fellows may select their institutions and their fields of study. Awards are for 1 year. Although the fellowships are awarded to "potential college teachers," they entail no obligations to enter the academic profession. They are designed primarily for those who have not yet begun graduate work.

Grants of $2,000 each are made to the university at which each Woodrow Wilson fellow enrolls: three-fourths of this amount must be used for financial aid to graduate students, particularly in their final year.

Southern fellowships

The Southern Fellowships Fund, acting for the Council of Southern Universities, Inc., with funds granted to the council by the General Education Board, is offering a program of fellowship awards and grants-in-aid for advanced study or research to qualified persons in 14 States. These awards are primarily to advance teaching and research in colleges and universities in the southern area.

The basic award is $1,500 to $2,500, plus an amount to cover tuition and required fees. Additional allocations are made for dependents. The size of stipend depends on the level of advancement of the student, the larger amounts going to the more advanced fellows.

The grant by the General Education Board was a sum in excess of $3 million, which is to be spent during a 10-year period. This amount may provide for a total of 1,000 fellowships over the 10 years.

Mr. DERTHICK. With the economy of time in mind I have finished the testimony that I formally planned to present, Mr. Chairman. I wonder if there are any comments or questions.

Mr. ELLIOTT. Mr. Commissioner, I would like you to summarize this section on what you call graduate education with respect to what the money would actually be used for.

Mr. DERTHICK. Mr. Chairman, again because of the fact that right now we have a replacement need of 18,000, turning out only 9,000, and half of those are already in teaching—the whole rest of society in addition to teaching has to draw upon that restricted pool—we have designed this legislation. Its purpose is to step up the training of Ph. D.'s for college teaching, the people that are the real seed corn in this whole business.

An institution—and there are not many of them relatively that give these degrees—would submit an institutional plan even as a State in the other part of our program submits a State plan.

This institutional plan would outline measures that the university would take to increase its output. For example, if it had X number of graduate students it was training now as Ph. D.'s, this university would say, "Now, if we could have so much money"—we match them up to $125,000 in this part of the proposal—"to add faculty, to add to the library, to add to laboratory or other facilities, we would increase our load of graduate students by 10, 10 more than we can now train at all."

In other words, we would make sure that we would increase our production by 10 students. Then we would work with them on those matching grants to increase their machinery and resources for adding the 10-student load.

That is one part of it, the grants to the institutions on the basis of the institutional plans.

In addition to that, the institution would award fellowships which this bill would provide up to the number that they could take in their institution. The fellowships would average $2,800, we figure. It would be about $2,000 plus $400 for each dependent that the graduate student might have. These fellowships would not commit the student to teaching. The idea would be that if we increase the pool, teaching will get its share, and yet the institution undoubtedly would favor those who were pretty well committed to teaching, but that would be the institution's business.

That, in a nutshell, Mr. Chairman, is the program.

However, there is one other aspect. If the institution chose not to seek a matching grant to increase its facilities, as maybe it had enough facilities to take on more students, they might claim aid in the amount of $500 per graduate student in view of the matching grants to increase facilities.

Mr. ELLIOTT. That was one of the things I wanted to question you about. Suppose that an institution said, "Last year, and over a period of 5 years, we have been able to graduate 10 Ph. D.'s a year as an average. We want to shape our plans to graduate 20 a year."

How much financial benefit would that institution get under the matching provisions for an increase of 10? Would it be limited to $500 for each 1?

Mr. DERTHICK. It could be limited to $500 for each 1, if they elected to choose that part of the aid plan, but if the institution elected to choose the other part of the aid plan, the matching grant part, they might get up to $125,000, if they could show it would take $250,000 to increase their facilities and faculty sufficient to add that much load. They might need to employ more faculty members and they could get matching money for that purpose.

Mr. ELLIOTT. Have the graduate schools explored the idea of using people who are not so highly trained or not so highly educated to do some of the tasks in connection with the teaching process?

Mr. DERTHICK. To save the time of their more qualified teachers?

Mr. ELLIOTT. Yes.

Mr. DERTHICK. I think I will call on our Assistant Commissioner for Higher Education, Dr. Blauch.

Mr. BLAUCH. It is known that many schools have what they call teaching assistants; in many cases they are laboratory assistants or they may even teach courses in the undergraduate college. That, of course, provides very valuable teaching experience so that the assistants will be better teachers after they receive their degrees. On the other hand, that strings out the getting of a degree to 6 and 8 years in many cases, which means the process of producing doctors of philosophy is pretty slow. It was felt that these fellowships should be limited so that the students will receive their degrees much more rapidly and therefore the supply will be greatly increased. That is a problem that has concerned deans of graduate schools very much

in recent years, the fact that it takes many of their students so long to obtain the degree.

Mr. DERTHICK. May I turn this another way, Mr. Chairman, to be sure that we have answered your question. We heard testimony here yesterday in which much emphasis was made about training technicians, who were not the full-grade engineers, who would relieve engineers of many tasks that would enable an industry to spread its engineering talent further. In other words, one engineer might do twice as much high-level work if he had enough technicians. I think what the chairman is getting at is, Do you know of any graduate schools that are deliberately employing the device of relieving their top professors of certain duties that they are now performing in order that those top professors may give personal and individual attention to more graduate students?

Mr. BLAUCH. Yes. It is true that these top professors in many cases now have clerical services available and they have other devices that help them to handle more students.

It is true that the graduate assistant, the man who is working for a doctor of philosophy will in many cases relieve him of part of the work. We might as well admit that some graduate schools have been developed partly on the basis of using graduate assistants to help the top faculty members.

Mr. ELLIOTT. Dr. Blauch, do you have any information that would indicate that graduate schools are turning students away who desire doctor of philosophy degrees? Do you have any information of that kind?

Mr. BLAUCH. We do not have specific information. We have a general impression, though, which we picked up from going to meetings where these matters are discussed, and in the larger institutions practically every department limits definitely the number of graduate students it will take. It limits those oftentimes on the basis of the number it will take, and in other cases it limits them by setting the standards so high that only a limited number can qualify.

I might say, however, that for many of these colleges which graduate only from 10 to 100, the serious problem is getting enough good applicants. Many of those colleges are so staffed that they could take more persons as graduate students, provided they would have enough applicants to warrant it.

Mr. DERTHICK. That is where the fellowship part of our program comes in, to encourage a likely candidate to pull up stakes and to cut loose with his family and undertake this long ordeal of earning his degree.

Mr. ELLIOTT. I was just thinking that a good system of fellowships might do as much to increase the number of applicants as anything else you could do.

Mr. DERTHICK. Our major emphasis is on the fellowships for that purpose, but as to the other part of the program, we realize the institution has to have aid in order to tool up for this increase.

Mr. ELLIOTT. Mrs. Green?

Mrs. GREEN. Following Mr. Elliott's question of the possibility of the best instructors in the graduate schools having assistants to relieve them of some of the clerical duties, have any school systems experimented with the possibility of having teacher aids, or whatever

you want to call them, at the elementary and at the high-school level to relieve the good teachers of the clerical work and the thousand and one other minor tasks that they have to perform that have no relation to instruction?

Mr. DERTHICK. Yes, Mrs. Green, there has been some experimentation along that line.

Mrs. GREEN. Whereabouts?

Mr. DERTHICK. In Michigan. I will attempt to give you some information about it. It may be that Dr. Ludington has more of the facts at his fingertips. If you do not, I will proceed.

Mr. LUDINGTON. You go ahead.

Mr. DERTHICK. In Bay City, I believe it is, in a foundation-supported project there has been an experiment spread over several years of furnishing teacher aids as a measure of meeting the teacher shortage so that the talents of the very best teachers may reach a larger number of pupils. In other words, instead of taking 25 or 30 in a class with a master teacher, you might have 40 to 60 pupils in a class with a teacher aid, someone who is qualified in character and personality, but who may not have had a great deal of training, who will come in and help with the chores—the recordkeeping, the supervision, handling the wraps, and blackboard work, and supervised study, and the like. That has been going on for several years.

A good many serious doubts have arisen, but the experiment is still underway, and it may be that something of merit will come out of it. However, there has not been a very great response on the part of teachers to the idea.

Mrs. GREEN. This has been the only place where there has been this experiment?

Mr. DERTHICK. That is the only place I think of at the moment. There may be other places, but that is the most noted experiment that is going on.

Mrs. GREEN. And that was only on the basis of relieving the teacher shortage?

Mr. DERTHICK. Yes, ma'am, and bringing the talent of the master teacher to more youngsters.

Let me ask Dr. Ludington to indicate an experiment in Indianapolis that is not of such magnitude, but it does suggest aid along the lines you have mentioned.

Mr. LUDINGTON. The Indianapolis project is not exactly along the lines of the Bay City one, but it is concerned with giving high-school seniors, that is, those who have a potential interest in teaching, opportunities to gain some direct experience as teacher aids in elementary and secondary schools, and we feel that that experiment, at least from what we have learned of it, has been very successful in identifying youngsters who might go on and prepare themselves as teachers, while at the same time relieving teachers of some of the chores that have been placed upon them.

By and large there has not been too much experimentation of the kind you suggest.

A few communities are using mothers at home in reading some of the English and other papers in order to relieve teachers.

The question there is, Does the teacher of the class lose thereby in her efforts to work more effectively with students?

However, that is another approach, one which is used rather extensively at the college level.

Mrs. GREEN. Both of them strike me as very nonprofessional, both using high-school students who ought to be training to be scientists, or engineers, or whatever you want, and, secondly, using mothers. On a haphazard basis.

Mr. LUDINGTON. That is right.

Mr. DERTHICK. So far there has not been a very warm response to this concept.

Mrs. GREEN. Why?

Mr. DERTHICK. I think teachers feel that with 60 children in the class they cannot have the relationship they want to have even though they have this aid pick up the lunch money and all these little chores.

Mrs. GREEN. Do you mean to tell me under the present circumstances with 30, or 40, or 50 and a thousand and one chores, they can have the kind of relationship they want?

Mr. DERTHICK. No; I do not tell you that at all. The point is that teachers seem to feel that this is not the answer.

Mr. HASKELL. Will the gentlewoman yield?

Mrs. GREEN. Yes.

Mr. HASKELL. What would you say is the most desirable number of pupils per teacher?

Mr. DERTHICK. That is a rather difficult question. There are a number of school systems in the country that do not want over 25 students to the teacher and as soon as they reach 25 they organize another class.

Mr. HASKELL. That 25 would be sectioned? In other words, 1 teacher to 25.

Mr. DERTHICK. Yes, sir.

Mrs. GREEN (presiding). Mr. Gwinn.

Mr. GWINN. We are having two committees trying to function together, Mr. Derthick. When we get under the iron rule of the chairman of another subcommittee out here we cannot get in to hear witnesses in this committee.

I wanted to hear your statement and I am at a loss to know how to question you a bit. For instance, the first eight pages of your statement seem to be devoted to counseling.

Mr. DERTHICK. Testing, counseling, and guidance, Mr. Gwinn, and we covered that on February 5. I believe you were present most of the time. However, we would be very happy to answer whatever questions we could that you might have on testing, guidance, and counseling.

Mr. GWINN. It is just the same old question of whether or not we are going to pick up this in the ordinary course and do what seems to be the thing to do in each of our school systems. Also, we ought to assume that the Federal Government cannot do much about it if they do not want to have a counselor. If the teachers think they can help the youngster steer his course, then the counselor is not taken in that high school, and in another case he is. I suppose that is a fact; it is not?

Mr. DERTHICK. Of course, the teacher is the primary agent in this whole counseling and guidance process, but the good teacher feels the need of the aid of a trained counselor in the technical aspects of the process, the giving of tests, the interpretation of tests, the vast amount of information about educational guidance, and college requirements, and the home and family situation

As we brought out in our discussion, you and I, the last time, we expect the parents and the home to be brought into this thing closely. The classroom teacher without this specialized knowledge and being confined pretty well to the classroom with all these students would not have the means of entering into this entire process which goes from the home to the school and even to community agencies.

Mr. GWINN. The question in my mind is always how to stimulate the parents to take an interest in all this and to know what is going on in their school systems and to play a part in them.

I think we are disposed in our communities to assume either that the board of education is doing the job or the superintendent is doing the job, and the parents under more and more pressure from the government go about trying to make a living to pay the bills and the taxes.

Now you work out a scheme of counseling. The Federal Government comes into that.

I wonder if we will be inclined more and more to let somebody else, especially the great and powerful Federal Government, be responsible for guiding and testing our children and think that is better than those who are naturally and should naturally assume these responsibilities.

Mr. DERTHICK. May I give you this experience? In my superintendency at Chattanooga, one of the things we introduced in that period was the visiting teacher, who is an important part of this counseling process, to bring in the parents and to bring them close to school. It is good for the child who is out of adjustment or who is not making headway for any one of many reasons to have a trained visiting teacher who knows how to get into the classroom situation, to make a partner of the teacher, to go to the home, and interpret the child's problem there. Through teamwork I have seen the most wonderful things happen, a child's whole point of view toward life reoriented along positive lines, and in that process sometimes various community agencies are brought into the picture. However, we did not have one of these visiting teachers. Realizing that such a service is a part of the counseling process, we asked the same question you have raised: How can we get the local school board and citizens to provide this needed service?

At that point we enlisted the aid of certain civic clubs, as I remember, and also the League of Women Voters, and we got the service put in on an experimental or demonstration basis. When the people began to see what the visiting teacher did for children and how her work strengthened their school programs and cut down dropouts and increased scholastic achievement, they increased this service and spread it until it finally became a whole division in our school system.

The point of this program in the literally thousands of school districts in this country that do not have these devices, do not have these services, do not have these scientific techniques, is to let the Federal Government come along with this 4-year program of matching grants and, on the basis of State plans, State designs, State-administered, with the State and local boards putting up part of the money, to help introduce these services; and it is our conviction that when school districts have a chance firsthand to see what happens to children in their schools with these resources introduced that they are not going to be satisfied to do without them. They are going to support them

and extend them and, when the Federal program goes out, to assume the full responsibility.

I am convinced out of my own experience that when fathers and mothers and teachers and others concerned see what we can do with children when we provide these modern services they are not going to be satisfied to do without them, because people, when they once see something of value to their children, are ready to make the sacrifice to continue it.

Mr. GWINN. I do not quite see the theory on which we could do this either. I believe it is possible to justify the scholarship program of prizes to stimulate the need for national defense. I think we can justify that on the ground that that is a function of the Federal Government clearly to protect our lives and property from attack from abroad, and we need, therefore, as a part of the military to get even the youngsters in training and to certainly select those that would naturally develop as our defense.

Now, when you get into the school system on the theory generally that the parents and the teachers are not finding out what the potentials are, or better potentials or possibilities of our children, I just naturally fear it more than I trust it. The Federal Government is going to have ideas about what the capacities of our children are.

In some of these tests, are we not going to subject the child to social tests or social attitudes which some testers will think are good signs and I might think are bad signs in a child? He is going to be a rank worshiper of the State for sure if he believes so thoroughly in the Government doing things for everybody, including himself.

Some people believe in that and they might slant the test that way; is that possible?

Mr. DERTHICK. I cannot conceive of that, Mr. Gwinn. Let me say that in the first place I think that this plan for administering the program is foolproof insofar as the preservation of State and local control.

In the first place, the State does not have to go into it if it does not want to and, if the State does participate, it does so in accordance with its own plan and with its own administration of the plan.

There have been other citizens and leaders who are as conscientious as you are in their very genuine doubts about Federal aid, and yet I have seen them become convinced of the urgency of this program in the national interest.

That is the way we justify it. I do not think at all that we can afford to see these 200,000 youngsters every year in our graduating classes in the top bracket of their classes not go on and develop those brains so that they will become more useful to the country and more creative, and not only that, but to bring those same individuals greater rewards of richer living and service.

Therefore, these good people have become convinced that this is an urgency, and with regard to the teachers, I do not think it is a reflection upon the teachers that they let so many of these youngsters slip through their fingers, because in the systems that are most efficient in this respect teachers need and welcome these aids.

Unless we give them these resources they are denied the modern tools that it takes to do an efficient job in education.

It would be the same as if a manufacturing concern attempted to operate with the tools of 25 or 40 years ago.

Mr. GWINN. On that, we have been accustomed to thinking that, if we do a good job of teaching the basic subject, we will learn about the boy and the girl through his examinations, as to what his potentials are. If he passes a grade of 95 in algebra, that is a pretty good sign about a lot of things that you know right away. You do not have to put him through any modern testing system.

Are we not in this danger of having another system imposed on our already burdened system of education to find out about the child when we have not done the job by which we used to find out about the child; that is, we have not given the subject matter that we now think is essential. I think I see a failure in your office to be emphasizing the basic subject matter of education and inclined to join in with the professionalists, as Admiral Rickover criticized, in methodology, and in how to teach the child himself as the very object of our concern as far as his training goes, so that we are adding another thing.

We had to have time to go through the traces that we have now set up in our system. Maybe that is all wrong. If it is wrong, then the Federal Government is adding another procedure, another method of finding out the truth about our children's capacities. Is that not the question?

Mr. DERTHICK. Mr. Gwinn, you and I do not have any quarrel about the importance of basic subjects and thorough, honest industry and work, or about the importance of teachers knowing their subjects, but they also need to understand children and know how to teach those subjects. They need both. In other words, I would not dispute your insistence upon the necessity of thorough knowledge of subject matter, but they also need the other.

The whole purpose of this program is to motivate and to stimulate interest.

Many a child who makes 95 on algebra may have less ability than someone that makes 75 on algebra. The child that makes 95 may be making a terrific effort and the teacher may be entirely oblivious to the fact that this 75 child may be a near genius, and we want to provide, not add anything on; we want to supply the tools that will enable this good teacher to do better what she is trying to do, anyway.

Mr. GWINN. Do you not think that genius is going to emerge even under our crippling processes that we now have?

Mr. DERTHICK. That is the whole problem, Mr. Gwinn. That genius may drop out of school in the 10th grade for lack of this testing, guidance, and counseling process, and they do. We simply are not equipped to make these determinations with the old ways. We have to have these new methods and new resources. That is the whole purpose.

Mr. GWINN. We hear so often of the battery of tests. Have you described in your statement those that you propose to give?

Mr. DERTHICK. We do not have the tests, Mr. Gwinn.

Mr. GWINN. I mean the thing that you are supposed to support. What do you propose to give? What do you expect to subject the child to by way of tests?

Mr. DERTHICK. I think it would be very wrong for us to suggest or outline any particular testing program. That is what we want to avoid from the Federal Government. We want to put that responsibility on the State and the local school systems.

Mr. GWINN. They may not be exercising their responsibility. That is what you say. They are not doing the job, so we want to encourage them to do the job by money. We may be using Federal money to be putting the children through a bad or an indifferent type of testing that will not do the job you speak of.

Mr. DERTHICK. The only point there is that I respect the professional competency of the leadership in the States, and we would not expect them to do a poor job any more than we would expect a group of doctors to do a poor job running a hospital.

Mr. GWINN. However, is that not in effect what you say we are doing? We are doing a poor job which we need to do better by this system of tests and counseling?

Mr. DERTHICK. We say that if we give this aid we will stimulate the States and local school boards to introduce these resources that we are convinced are needed and we will aid them in doing so.

Mr. GWINN. I do not see any special difference between our using Federal money to get them to build the school buildings that we think they ought to have and then turning up and finding we have just built with Federal money a traditional classroom that is already out of date according to Alexander Stoddard, who is advocating television rooms now instead of the old traditional schoolrooms. We may do the same thing in this testing business, may we not, encourage things that are not up to date or encouraging a theory of testing that may not be right?

Mrs. GREEN. Will the gentleman yield?

Mr. GWINN. I will. I am in trouble anyway. I would be glad to yield.

Mrs. GREEN. For the record, is not the testing of the guiding and counseling service widely used throughout almost every State and your recommendations are simply to enable us to use it more widely than at the present time?

Mr. DERTHICK. Yes.

Mrs. GREEN. It is not something new that is going to be different or is going to disrupt the local schools.

Mr. DERTHICK. That is a point very well taken.

As I have repeatedly said, I think our best schools in this country are unsurpassed and it is the established and proven and demonstrated methods of testing, guidance, and counseling that have been going on for a number of years that we want to spread all over the United States so that we can stop this loss in our best brainpower. It is not an experiment, Mr. Gwinn. It is an established procedure.

Mr. GWINN. I want to see these communities do everything possible and they ought to do more. I agree with you there.

However, I dislike our pretense that we can see this thing better than they can. I just cannot get that.

Mr. DERTHICK. It is not a question of our seeing things better than they can. It is a question of our looking out over this public school system in the United States and seeing the best practices that produce good results, that discover these youngsters and bring them through to a very high degree.

If in a certain school system they graduate 80 percent of their youngsters from the 12th grade and in another school system they only graduate 40 percent, we believe that one of the big differences is a sound testing, guidance, and counseling program, and if in this school that graduates only 40 percent we encourage and stimulate them to put in these methods, their holding power will increase and, instead of losing some of these bright youngsters, they will bring them through to graduation and they will also be oriented toward further training in college.

Mr. GWINN. I do not know that it is as simple as that.

Mrs. GREEN. Will the gentleman yield?

Mr. GWINN. Yes.

Mrs. GREEN. I am confused as to what kind of a testing program the gentleman from New York would advocate. At one point he is opposed to the Federal Government doing anything in the way of counseling and guidance or encouraging testing because of the danger that we might impose something upon the local school districts; and yet at another point he says, well, the local districts may not be giving the right kind of counseling and guidance service and the right kind of testing.

If we should have it where would the gentleman from New York draw the line?

Mr. GWINN. I want the folks back home to do everything conceivable to spend all the money we can get them to spend to improve their school systems, raise salaries for teachers, and tests, but I just do not like the pretense coming out of Washington that we know better than they do about what to do. I do not think the money enters into it much.

Mrs. GREEN. The Commissioner's recommendation is not that we know better. It is simply that we help the local districts to do the kind of job that some of them are already doing.

Mr. GWINN. I am not sure when you help that person. I am very doubtful. That is one of the hardest things that the gentleman from West Virginia has to face. When do we help that son and when do we give him false notions, maybe through the most elaborate tests that the Federal Government may think are better. I think the Federal Government knows what our national defense is better than we do. We cannot know back home. We have to have soldiers and technicians and the electronic engineers, and we have too few of them for the national defense. Then the Government is the only source we can go to. It is the source. We have to rely on it. As poor as it is, it is the best we have.

When you get beyond that, it seems to me I would reverse the statement and say as poor as we are back home we are still proud anyway and we are trying, and out of that trying comes a truth that may not be imposed from the outside.

Do I not have any support for this theory of mine in the profession?

I have gathered that Sorokin of Harvard rather agrees with me in his fads and foibles in these tests.

Is there any disagreement among the scholars with you, Doctor?

Mr. DERTHICK. In the first place, let me say that you have very well defined one aspect of the national interest.

The thing that gives us concern is that with 50,000 school districts in this country you cannot expect them all to move forward immediately in this urgent national interest so that there are too many young-

sters like the one Mr. Bailey described in West Virginia that are slipping through our fingers and there is not any way to wake up these school districts all at once and get them to move fast enough to meet that problem.

I have a great deal of evidence here on the effectiveness of guidance programs.

Let me just, if I may, Mr. Chairman, give one statement:

> The values of guidance services have been clearly indicated by several well-designed studies. In an experimental study extending over a period of several years Rothney compared the progress and adjustment of a group of students receiving guidance services in a high school with a matched group in the same school receiving no organized guidance. On some points there were distinct differences favoring the experimental group receiving the benefit of guidance services. Only 10 percent of the control group became honor students in high school, while 27 percent of the experimental group made honor grades. There were considerably fewer curriculum changes made by the guided group and after graduation from high school 53 percent of the guided group gained college admission as compared with 35.6 percent of the unguided group.

You see, Mr. Chairman, we have so many evidences from these better school systems that have these programs going, not experimental programs, but well established programs.

What it means to children is that it raises their grades. It increases the number of honor students. It advances the number going on to college, and that is the whole purpose of this whole program.

The answer is that it works and that it cannot be made to work in 50,000 school districts soon enough for the national interest unless we come in and stimulate by our proposal.

Mr. GWINN. You propose to do that as far as you are concerned solely by sending so much money to the States to be designated for this testing and counseling work?

Mr. DERTHICK. Yes; but we do not propose to tell the States how to do it. We identify this great national interest. They are well informed about these practices and it is up to them to design a plan for instituting these practices and for administering the program.

Mr. BAILEY. Could I ask a question at this point?

Do you require the States to submit plans?

Mr. DERTHICK. Yes, sir; a State is required to submit a plan.

Mr. BAILEY. Without any suggestion from the Federal Government? In other words, you are studiously avoiding the thought of the Federal Government control.

Mr. DERTHICK. That is right.

To illustrate it, the proposed bill calls for early testing. No one could conceive of a State that would submit a plan that would call for the first testing at the 12th grade, but if they did there would be consultation back and forth.

The relationship between the Federal and the State Governments is purely a professional one at that time. It is not based upon regulations or requirements.

Mr. GWINN. Who disagrees with you, Doctor, about this among the scholars; that is, whether or not fundamentally this approach finds it the product that you are after?

Mr. DERTHICK. I presume, Mr. Chairman, and Mr. Gwinn, that this committee will have before it other people giving testimony on the merits of this program and probably they should speak for themselves.

However, we have not found any scholars that disagree with us

and that say that this will not work, because it is not an experimental program. It has established and proven itself over and over again.

Mr. GWINN. Have you seen Sorokin's book? There are three chapters in there against this testing idea as a legitimate way of finding the outstanding child.

Mr. DERTHICK. Mr. Chairman, let me say to Mr. Gwinn that testing is only one part of our program. We, too, would say that the testing of and by itself would be a poor measure, but the testing process that we would initiate at an early grade, perhaps at the seventh grade, would be accompanied by all of the information that could be gathered on that child by his teachers, his school grades, his reports, his conduct, and his home situation.

The guidance counselor, the visiting teacher, the classroom teacher, the school principal, the supervisor, all of those concerned would be building up a cumulative record that would be 5 years old and, on the basis of all of that evidence, the youngster would be identified as to his ability.

Mr. GWINN. Can we not say, then: New York knows all this, does it not, and Pennsylvania and California, and Ohio? They know the value of these things you are saying?

Mr. DERTHICK. Oh, yes; and they put great stock in the testing program as a phase of this process.

Mr. GWINN. We do not need to send this money to them then.

Mr. DERTHICK. I think you would find, Mr. Chairman and Mr. Gwinn, that there are a number of schools in every State that have not attained this level of testing, guidance, and counseling that is standard.

Mr. GWINN. They know all about it. You just said they are doing it in many places, so that all the other schools must know it is going on.

Mr. DERTHICK. They are, indeed. I come back to my point that there are school districts in every State in this Union that are neglecting this process and we are convinced that the national interest will not let us wait the number of years it would take for these processes and techniques to trickle into every single school district, because in every one of those districts there are very gifted youngsters that are being lost to the Nation.

Mr. GWINN. You are not going to confine this Federal effort to the place where the need is? You are putting no needs test on this program; are you?

Mr. DERTHICK. No. sir. However, we are placing upon the States the responsibility, and we know that they have the knowledge and the competency to administer the program so that it will reach every nook and corner of the State.

Mr. GWINN. Then you are going to give this money to a lot of places where they are already doing it and where the money is and where they do not need this extra Federal stimulus?

Mr. DERTHICK. We cannot conceive of a State not administering this money wisely and effectively so that it would reach first those districts most in need and bring them up to standard.

Mr. GWINN. You cannot conceive of the State not doing it itself; can you, really?

Mr. DERTHICK. That is not difficult at all to conceive, because the States are not reaching all the school districts and many States are doing very little.

Mr. BAILEY. Will the gentleman yield?

Mr. GWINN. Yes.

Mr. BAILEY. I am a little fearful of the gentleman from New York's idea which is support of groups like the chamber of commerce. Pretty soon we will have to start importing our businessmen in this country under the reciprocal-trade agreement.

Mr. GWINN. I think we are going to have to go to Europe pretty soon because we are sending almost everything we have over there.

The Greeks found that it was better to get their military people from other countries. Maybe that it not a bad idea instead of training them here and having dictators develop to run the shebang after they get through with the military operation.

Maybe we had better get strangers that will not have that influence over us.

Mr. RICHARDSON. We are getting, Mr. Gwinn, increasingly large numbers of our doctors from medical schools abroad and I saw in the paper the other day a reference to the numbers of faculty for colleges being recruited from countries abroad.

We do have there an example of the interest represented by this program, and our related proposal in the field of medical school teaching facilities, in expanding our capacity to train people in this country.

Mr. GWINN. Mr. Chairman, do we have any witnesses?

Mr. Derthick assumes we are going to have no opposition to his proposals?

Mr. ELLIOTT. I am not sure. I do not know what the witnesses will testify. We have made arrangements to hear, I believe up to this point just about every witness that has indicated a desire to testify. We have specially invited some as we did Admiral Rickover, Dr. Teller, and Dr. DuBridge, but what their viewpoint will be I do not know.

Mr. GWINN. Certainly Mr. Derthick is not giving us the opposition. Maybe he thinks there is none.

Mr. RICHARDSON. We gave Mr. Graham, Mr. Gwinn, a list of individuals who, to our knowledge, opposed some aspect or another of our program. I am not sure that any of them will oppose it as a whole, but it was the best we could do to comply with the suggestion that we supply the names of adverse witnesses.

Mr. GWINN. Thank you very much.

I must confess the doctor is quite persuasive. Maybe these professions do not want to oppose one of their own. Maybe you have that kind of a hierarchy in education now that we have to look out for.

Mr. ELLIOTT. Mr. Commissioner, so far as I am concerned I would like you to go ahead.

Mr. DERTHICK. All right, sir.

I might say, Mr. Chairman, that I am so challenged by Mr. Gwinn's inquiries that I wish I could take him to one of these schools and we could visit together and see this process in action. I know he would be a very pleasant traveling companion.

Mr. GWINN. Mr. Chairman, I think that there are these very things going on, but I do not want the community that is doing these jobs to get in the habit of looking to the Federal Government. I think they ought to do it. That is the point and I think the value depends

on our own personal work, sacrifice, and thinking to bring these things about and that we may dry up in these local communities all desire for this sort of thing if the Federal Government somehow or other provides for us.

Mr. DERTHICK. I believe that it will be like the experience I had that this will stimulate and prime the pump, and I think these communities are going to rise up and take hold of it and our whole concern is they are not going to do it fast enough without this stimulation, we believe.

Mr. GWINN. I wish it were a stimulant. I have an idea that it is more likely to be a crutch. I believe it works that way.

Mr. DERTHICK. Mr. Chairman, I am almost through with my testimony then, but I want to come to a very, very important part that might otherwise be overlooked. It has to do with the improvement of statistical services of State educational agencies and it is designed to strengthen our factual knowledge about the status and progress of education.

Mr. ELLIOTT. Let me interject right there, Mr. Commissioner, that we have had indications on the part of some of the people that we have talked to recently that the statistical services in your office might bear some improvement. Does the bill provide for anything along that line?

Mr. DERTHICK. That is the whole point, Mr. Chairman. We believe that this program is going to support our statistical studies tremendously and that is the whole point.

We have improved very substantially our in-office studies, but we depend upon 50,000 school districts and this is designed to strengthen their machinery for turning over information to us. We have to get it from them before we can act.

Mr. ELLIOTT. You may not be familiar with the fact that Dr. Devereux Josephs testified here 2 days ago that he thought that that field was one particularly in which the United States Office of Education could be improved.

I believe you are telling us that one of the reasons that your statistics are, as Dr. Josephs said, behind, is the fact that you do not have sufficient statistics from the States and Territories; is that right?

Mr. DERTHICK. That is the whole story. Ninety years ago the first Commissioner of Education was frustrated about trying to collect information from all these school districts. He just had a terrible time and we still have the same trouble. We cannot blame the States, because they have a terrific job to do, and we are calling on them for more and more information all the time. Sometimes in a State they will have to assign someone who already has a full-time job to do one of our studies. It may take 2 or 3 weeks or 8 or 10 weeks, just of and by itself, and sometimes that information will not come in for 2 years.

To do intelligent educational planning we need the information promptly.

You put your finger on the whole story and that is why we of the Office of Education are so tremendously interested in this part of the legislation, because we do believe it will strengthen us tremendously, not only us, but all the States, in this important task of knowing what is going on in education.

Mr. ELLIOTT. Did not the act that created the Office of Education specially envision that this would be one of your principal functions?

Mr. DERTHICK. Indeed so, and in my testimony I refer to that. I am very gratified that you are so well informed, with all that you have on your mind, about that historical aspect of our Office.

Mr. ELLIOTT. I was interested when Dr. Josephs said that his Committee on Education Beyond the High School found, and I am not sure that I am using his language——

Mr. DERTHICK. You are correct——

Mr. ELLIOTT. They found that that was a place where we could do some good, he thought, and I became very much interested in it.

Mr. RICHARDSON. I would like to inject, Mr. Chairman, that part of the problem of the Office of Education in carrying out its responsibilities for providing information about the status of education has been a problem in getting appropriations for that purpose. While one side of the job would be greatly assisted through the proposal here, another side of it can be assisted through increased appropriations directly to the Office, and we are now seeking this year another increase in funds for statistical services of the Office, particularly in the field of higher education, with the added impetus for that request that the Josephs Committee report has given.

I think Dr. Conrad could tell you, if you wanted to have more information, just what things we are proposing to do in order to try to carry out the Josephs Committee recommendations.

Mr. ELLIOTT. I realize that our time may be shorter than it was when we started, but I would like to know what that situation is.

Mr. DERTHICK. What we might do, Mr. Chairman, is two things quickly. As Mr. Richardson has said, we have a 2-sided job, 1 out in the field and 1 in the Office. Dr. Conrad could do two things. He could tell you the improvements that we made in the Office in the last 2 years with our increased appropriations and then perhaps he and Dr. Blauch could tell you what we contemplate for the future to strengthen this essential aspect of the Office.

There is not any function we have that is more important or for which we feel more keenly responsible. Dr. Conrad.

Mr. CONRAD. We have undertaken, as we promised to undertake, a number of new surveys to provide additional information. One on which we have a preliminary report in press now relates to the beginning teacher—the economic status of the teacher, his plans with regard to his career, and so on. We thought that this was an especially important point of attack and, as was shown in the press release giving preliminary results, about 50 percent, I believe, of these beginning teachers are not planning to stay in teaching more than 5 years. For a professional field this is an astonishing high percentage of planned abandonment of the work that they have been trained for.

We find that the average salary of these beginning teachers is, if I recall, around $3,600, and in some regions of the country is as low as $2,750. This is not an individual State, but a region of the country; in the small districts of the Nation, school districts with enrollment of fewer than 50, the salary is less than $2,500 per year, which, of course, is lower than employed unskilled labor can get at the present time.

We have tried to collect data and are in the process of finishing a study of suburban school systems, and along with it a study of rural education.

Mr. DERTHICK. Pardon me just one moment. I think the chairman would be interested in knowing that for 90 years we have been unable to collect the kind of data for rural school systems that we have for urban and suburban school systems and that only with these increases of the last 2 years have we begun to get these data for rural school systems that this country needs to know.

Mr. CONRAD. The rural school child represents, I think some people would assert anyway, the largest educationally underprivileged group in the United States today.

We speak of the farmer and the rural population being the backbone of the country, but they certainly ride on a very hard backbone in getting their education. Therefore, that study is under process.

In regard to the suburban school systems we have felt that it was desirable to obtain information there because very often these suburban school systems represent, so to speak, the lighthouse of elementary and secondary education. Many of these are communities where new parents are very conspicuous in number. There is a large fraction of the population interested in the school system, the PTA is a strong organization and these parents are willing to give vigorous support for improved practices, which would include the guidance and improved curriculums, which would include good science laboratories, and so on. We have asked questions in these surveys which get at the functioning of education, in addition to such relatively routine things as how large is the class, what is the age of the teachers, what are their qualifications, and so on.

We have also turned our attention to adult education and very recently the Bureau of the Census has issued—I believe it was just yesterday—a report on the extent of adult education in this country. The more detailed report will be issued by the Office of Education.

Briefly, this report shows that adult education is rather less common that has been stated by some of the enthusiasts in the adult-education field, and a good deal of detail has been gotten on the kind of people who are taking adult education. To some extent it may be like those who are going to church. Those who need the church most are sometimes least likely to attend, and we find in the case of adult education that those who have had the least formal education are least likely to attend. There is an obvious moral: namely, that those in adult education have to make a greater effort to attract these persons who are perhaps in greater need than those who actually attend.

I should add that the funds that were obtained were used not only to support new studies but to provide better services to other divisions in the Office of Education. We have had recently a survey on financial aids to students that are available from the colleges. Two directories have been published now, as Dr. Derthick has told you, one for scholarships and one for fellowships, and a statistical analysis of the data collected is now underway. It is well near completion at present.

Dr. Blauch is in charge of the study as Assistant Commissioner and we have supplied a great deal of statistical service to ferret out the

relationships that are of interest in connection with these scholarships and fellowships.

We are also undertaking to provide improved forecasts, or as the statisticians call them, projections, with regard to enrollment, the number of graduates to be expected, the amount of money that will be needed in future years on the basis of the rate of expenditure in the past, and so on.

We have been extremely busy, Mr. Chairman, in trying to use this money wisely in the manner that I have indicated.

Mr. DERTHICK. Mr. Chairman, just take a moment for Dr. Blauch to tell you some of the things that we are looking forward to that are new that we are able to do because of increased appropriations in the past.

Mr. BLAUCH. I think one of the most significant things we are undertaking now is a rather comprehensive analysis of the gathering of statistics in higher education from the point of view largely of the uses that are made of the data.

We do this through committees and through conferences of users, persons who are in policymaking positions, to find out from them what kind of educational data they need most. Then we will try to devise a statistics-gathering program in the field of higher education, which was the particular field that Mr. Josephs was talking about, so that a part of this additional money is going to be used to take a comprehensive look at the whole field of higher education statistics.

Some of it is also to be used for the expensive machine tabulation which goes along with some of our studies and for which we have never had as much money as we need.

Those are the two principal things, we would say.

Mr. ELLIOTT. How much money did you have in the fiscal year 1958 which is coming to a close now?

Mr. DERTHICK. For the statistical services?

Mr. ELLIOTT. Yes.

Mr. CONRAD. About $550,000.

Mr. ELLIOTT. How much money did you have the year before?

Mr. CONRAD. About the same amount the year before, but the year before that it was about one-third.

Mr. ELLIOTT. About one-third?

Mr. CONRAD. Yes, sir.

Mr. ELLIOTT. Since the report on the study of education beyond the high school came in last year, what are you asking for?

Mr. DERTHICK. The major thing Mr. Chairman, that we are asking for is this legislation here, although we are substantially increasing the budget in the higher educational division to step up studies there.

How much is that increase?

Mr. BLAUCH. About $180,000 above what we had normally been asking for this year.

Mr. DERTHICK. A substantial portion of which will go into these studies on higher education.

Mr. ELLIOTT. Would that $180,000 be in addition to the $550,000 that you have been getting?

Mr. BLAUCH. Yes, sir.

Mr. ELLIOTT. If we pass a bill with this title you will need that additional amount very badly?

Mr. DERTHICK. The bill with this title treating the part that I shall next discuss is over and above all that. It is to strengthen the field in their statistical gathering resources.

Mr. ELLIOTT. I understand that, but at the same time the two work together.

Mr. DERTHICK. That is right. We are helpless. We might build up here completely an ideal but we would be helpless unless we had the field strengthened.

I might say, Mr. Chairman, you note that very marked increase in 2 years' time in this program.

Secretary Folsom has taken a tremendous interest in the Office of Education generally and when he came down to be Secretary, he was very much astonished at the limited budget on which the Office was operating; and particularly was he disturbed at the restrictions on our statistical gathering machinery, so it has largely been due to his interest that we have been able to move ahead.

Mr. ELLIOTT. Have you been before the Subcommittee on Health, Education, and Welfare, of the Appropriations Committee to justify your request for additional funds?

Mr. DERTHICK. Yes, sir; we have appeared.

Mr. ELLIOTT. I would like to have a copy of the statements made at that time with a view to possibly incorporating them in this record.

Mr. DERTHICK. Mr. Chairman, we should be very pleased to supply you with that record.

Mr. ELLIOTT. Thank you, Mr. Commissioner.

(Information referred to was subsequently supplied and follows:)

OFFICE OF EDUCATION BUDGETARY PROPOSALS FOR FISCAL YEAR 1959

Higher educational institutions

1958 estimate:	
Positions	35
Amount	$317,400
1959 estimate:	
Positions	78
Amount	$650,000
Increase (+) or decrease (−):	
Positions	+43
Amount	+$332,600

The Nation is now confronted with unusually difficult problems in higher education. Some of them have been pointed out and described by the President's Committee on Higher Education, others have been emphasized by the rapidly evolving international situation. It now seems clear that these problems must be attacked without delay. The colleges and universities are willing, within the limits of their resources, to deal with these matters, but they require a great deal of assistance from the Office of Education. Indeed, they will be greatly limited in their efforts unless they can obtain much more information and service than is now available.

The following projects and activities are proposed to meet this objective:

1. STAFFING THE NATION'S COLLEGES

College faculties are in critical condition throughout the country because of loss of trained teachers to higher paying jobs in industry and because trained members are not being recruited in sufficient numbers to keep up with increasing enrollments. The proposed Office study will assess the demand for college teaching and research personnel and evaluate the supply of teachers available to meet the need. The question of deterioration in the quality of teaching will also be examined, as will the loss of teachers to other fields of activity. Informa-

tion on teaching loads and use of part-time staff and graduate assistants for teaching purposes will be assessed. The use of new teaching methods and plans for coping with larger enrollments will be studied. Also, attention will be given to the capacity of graduate schools to produce the teachers needed for college and university facilities.

2. STATE AND INSTITUTIONAL SURVEYS AND PLANNING

(*a*) *Inventory of college and university physical facilities.*—For some years colleges and universities, State survey commissions, and national and regional associations interested in the provision of adequate facilities for higher education have wanted the Office of Education to make an inventory of the physical facilities of higher education. The President's Committee on Education Beyond the High School reemphasized the need for this information.

A foundation or baseline of information is needed which will indicate what facilities exist, their condition, their character, and their location. Data supplied by this inventory will permit more accurate projections of physical facilities needed and will serve as a starting point for the determination of the effectiveness of utilization of existing space.

Funds are budgeted to enable the Office to complete in 1 year a comprehensive inventory of the physical facilities of colleges and universities.

(*b*) *Staff services for State and institutional surveys and planning.*—The anticipated expansion of higher education to accommodate increasing enrollments and to provide new programs required by technological and social development require extensive surveys and planning by States, regions, and institutions. Currently, such activities are underway in some areas but progress lags elsewhere. More of them would be undertaken if the Office could provide some assistance and guidance for them.

It is proposed to study all forms of State and institutional organization of higher education, the financial support of higher education, and such other matters as enter into intensive and long-range planning, and to make surveys and assist in such surveys as are requested by responsible agencies.

These studies and services are particularly required since the proposed grant program for aid for statewide planning of higher education will not go forward.

3. HIGHER EDUCATION STATISTICS

The demands on the Office of Education for increased statistical services have greatly accelerated in recent years, but the resources of the Office to meet these demands have not been augmented commensurately. Indeed, the Office has fallen behind to the point where marked criticism has been noted by the President's Committee on Education Beyond the High School, which has strongly urged an immediate attack on the problem.

While it is proposed that a general review will be made of higher education statistics in order to refine present operations and results, studies have already been made which indicate the need for the following additional recurring services:

(*a*) Perpetual inventory of physical facilities and their use, including emphasis on unit-cost data.

(*b*) Student accounting series, including (1) secondary school origins of college students, (2) enrollment by fields of study, including professional fields, (3) student financial assistance, including scholarships, fellowships, loans, and work programs.

(*c*) Faculties, including employment by fields and professional schools.

In addition, such studies as the residence and migration of college students, now conducted each 10 years, would be made each 5 years. Studies of attrition in the various disciplines and professional areas would be made more frequently.

A number of special studies of a problem-solving character would be undertaken annually, such as the extent of utilization of nonacademically trained faculty, the use of special teaching devices, and the like.

Special emphasis would be placed on the rapid processing of data and the publication of final results. This is essential during a period of planning and development which higher education institutions now face.

In addition a clearinghouse of institutional research in problems in higher education will be established and maintained. Reports will be published periodically in loose leaf form and will serve to provide widespread dissemination of research results for use in higher education planning.

4. COLLEGE PROGRAMS OF LESS-THAN-BACHELOR'S DEGREE LENGTH

During the past year, there has been a tremendous increase in interest in community and junior colleges. Many States, regions, and districts have come to accept the community college as one of the best solutions for the increasing problems in higher education.

Recently, the activities of the President's Committee on Education Beyond the Higher School, the second report to the President, the increased emphasis on scientific and technical education, and the decentralization of higher education have together combined to accelerate this increase in interest.

It is proposed to undertake the following activities:

(*a*) To provide current information on the development of new community colleges in the United States, the reasons for their development, problems encountered and their successful solution.

(*b*) To make studies which will assist in determining effective techniques in development, staffing, curriculum, financing, personnel services, housing, and administration of community-junior colleges.

(*c*) To develop criteria for the establishment of community colleges and techniques for relating these criteria to local situations.

(*d*) To assist in and encourage controlled studies for the improvement of instruction in community colleges, and to develop plans for the collation and distribution of these results.

(*e*) To cooperate with State and regional agencies in examining the total post-high school needs and services.

5. TEACHER EDUCATION

The problem of providing an adequate supply of fully qualified teachers for the elementary and secondary schools has long been paramount. Recent events have underlined the need for renewed efforts to draw into teaching, and especially into the teaching of science and mathematics, a full share of intellectually capable and competent people and to enhance the skills and effectiveness of those who now comprise the teaching force.

Studies are greatly needed to indicate the best methods of motivating able young people to choose teaching as a career and to provide them with an optimum training situation. Inservice training of teachers also deserves further study in order to improve practices and stimulate greater effectiveness.

Especial emphasis will be placed upon the foregoing activities and, in addition, increased attention will be given to counseling and guidance as a part-time function of teaching to the end that all teachers may participate adequately in the process of proper educational placement and in satisfactory student choices.

The foregoing studies must be greatly expedited to assist in meeting the problems enunciated by the President's Committee on Education Beyond the High School and to meet the needs created by necessary emphasis upon new elements of the curriculum in science, mathematics, and technology.

6. STUDENTS AND SERVICES TO STUDENTS

Increasingly in recent years, school and college administrators, department heads and deans, counselors and other student personnel workers have felt the need for accurate and up-to-date information concerning educational and vocational opportunities, employment outlooks and student financial assistance. The President's Committee on Education Beyond the High School recognized this need and recommended that the Office of Education under the responsibility and provide such information to the schools, colleges and students.

The rapidly mounting enrollments in colleges and universities are compounding the problems of the institutions in serving their students. Such matters as admission to college, student health, student finances, extracurricular activities, and residence (housing) of students become ever more pressing. Financial assistance to students is a matter of widespread concern and it should be a subject of continual study. The question of who shall be admitted to college and how the selections shall be made becomes more urgent as many more persons apply for admission than the colleages and universities can accommodate. In many stitutions the housing of students is a limiting factor in their usefulness.

The proposal is to study student services with a view to suggesting successful practices and provide consultative services to institutions, organizations, and individuals.

Mr. DERTHICK. I think in just a very few moments, because we have edited this testimony, I can finish.

Although the collection of statistics always has been a function of the Office, recent events have sharpened the critical need for further development of this role. Without exception, I believe, all users of educational statistics—State, local, and Federal agencies, the Congress, national organizations, and educational study commissions—at one time or another have lamented the unavailability of adequate State and National statistics, or have criticized them as being incomplete or out of date, as you heard Mr. Josephs testify the other day.

The report of the Committee for the White House Conference on April 6, 1956, complained about the situation and recommended that the States develop "adequate plans for the collection and dissemination of timely educational statistics."

Next I quote from Mr. Josephs, but in this particular testimony I will omit that, since Mr. Josephs has registered his views with you.

I believe it is perfectly clear that action must be taken to correct this situation. Yet, to carry out this function in relation to the public elementary and secondary schools, the Office depends entirely upon voluntary cooperative arrangements with the State departments of education and the local schools. Excepting the small amount of administrative reporting required under existing grant-in-aid programs administered by the Office, no Federal law requires State departments of education to submit educational statistics or reports to the Office of Education, and no Federal funds are provided to the States for the provision of this national service. While we do not know the exact costs to a State department of education for supplying data to the Office of Education, the amount is considerable.

As an example of the volume, a total of 11 single-time reports were requested during the period 1954–57. During the same time, there were 14 recurring annual reports, 2 biennial reports, and 4 reports which are requested on a periodic basis of 4 to 10 years.

One of these reports may require on a national basis data from 25,000 high schools, 50,000 school districts, or 1,800 colleges and universities, and may call for days and even weeks of time on the part of the staff in the State departments of education.

And I have an insertion here for the record giving certain supporting information.

Mr. ELLIOTT. Without objection the insertion will be made at this point in the record.

(The information referred to follows:)

SURVEYS IN WHICH THE STATE EDUCATIONAL AGENCY IS THE RESPONDENT

SINGLE-TIME [1]

1. State School Plant Services, 1954–55.
2. School Facilities.
3. School Finance and School Business Management, 1955–56.
4. State Aid for Capital Outlay and Debt Service, 1955–56.
5. State Transportation Services, 1954–55.
6. State Curriculum Services, 1954–55.
7. Financing Public 2-Year Colleges, 1954–55.
8. State Report on Instruction in High School English, 1954–55

[1] This group includes some studies which should be made periodically but for which there are no definite budget plans at present.

9. Audiovisual Education in State Departments of Education, 1956–57.
10. Guidance and Public Personnel Function and Services in State Departments of Education, 1957–58.
11. Report on Preparatory Technical Courses, 1955–56.

ANNUAL

12. Fall Report on Enrollment, Teachers, and Schoolhousing.
13. Educational Directory, Part 1.
14. Educational Directory, Part 2.
15. Annual Fiscal and Statistical Report of State Board for Vocational Education to the Office of Education.
16. Reallotment of the George-Borden Funds.
17. Annual Descriptive Report of State Board for Vocational Education to the Office of Education.
18. Statement of Qualifications for Positions Under the State Board for Vocational Education.
19. Departments of Vocational Agriculture for _____.
20. Enrollments and Placement of Graduates in Home Economics Education.
21. Supervisory Personnel in Home Economics Education.
22. Personnel in Colleges Granting Degrees in Home Economics.
23. Reallotment of Funds for Extension and Improvement of Practical Nurse Training, Fiscal Year Ending _____.
24. Report on Practical Nurse Training.
25. Reallotment of Federal Funds for Vocational Education of Personnel in the Fishery Trades and Industry and Distributive Occupations Therein Under Section II, Public Law 1027, 84th Congress.

BIENNIAL

26. State Elementary and Secondary School Statistics (Part of the Biennial Survey of Education in the United States).
27. Data on Cost of School Construction (for program of assistance in federally affected areas).

OTHER PERIODIC

28. Adult Education Services of State Departments of Education (every 5 years).
29. State Provisions for Financing Public School Capital Outlay (every 6 years).
30. Public School Administrative Units (every 10 years).
31. Public School Finance Programs (every 4 years).

In addition, State departments of education are asked to help select local schools or school districts to be surveyed in connection with other studies. An example is the Survey of Administrative Facilities in New School Buildings.

Nonreceipt of reports from State departments of education for biennial survey years 1951–52, 1953–54, and 1955–56

School year (July–June)	Number of State [1] reports not received in specified number of months following close of school year		
	12 months	18 months	24 months
1955–56	27	[2] 5	
1953–54	22	3	
1951–52	23	12	1

[1] Data refer to 48 States and District of Columbia.
[2] Represents number of reports not received through Nov. 14, 1957.

Mr. DERTHICK. You can imagine, Mr. Chairman, when these State Department people are loaded as they are, why it is almost impossible to keep from delaying our reports for months at the same time people up here are waiting and the whole Nation is waiting for the information that we cannot supply except tardily all too often.

In addition to staff shortage a number of States do not have the modern equipment needed to process quickly the materials for their own as well as for the Office of Education reports.

Mr. ELLIOTT. What type of equipment would that be?

Mr. DERTHICK. Let me ask Dr. Conrad to tell you.

Mr. CONRAD. Principally it would be modern equipment; IBM, or other equipment of that kind.

Mr. ELLIOTT. That equipment is very expensive; is it not?

Mr. CONRAD. It is.

Mr. DERTHICK. You might tell him about, is it $50,000 that we have in our budget for use of that equipment this year for just what we do?

Mr. CONRAD. We have $50,000 and I cannot repress the remark it is not adequate.

Mr. DERTHICK. No; it is by no means adequate.

When we do not have modern machines it may take weeks to put together data that they could put together in very short order and that is another reason for the delay.

Mr. ELLIOTT. As I understand, these IBM machines with a system of control cards, can gather information if it is available and put it together very hurriedly; can they not?

Mr. CONRAD. They can tabulate and cross classify information at remarkable speed, and they also can provide printed lists which are very valuable for verifying the information that is obtained, in this sense: That if two figures are side by side and they do not seem to be in the correct relationship, then you have immediately spotted a point where verification is needed. To do this by eye, so to speak, without the aid of a tabulation, is a much longer and more time-consuming procedure.

The machines help in the original tabulation and very greatly help in analysis of the data, which permits you to interpret the data in a more meaningful way.

Mr. DERTHICK. Timeliness and reliability of information are equally important. The Office of Education must collect educational information with dependable meanings if it is to report properly to the Congress and the people on the conditions and progress of education. Fundamentally, the reliability of educational data depends upon the general acceptance of uniform records and terminology. Only when items have the same meaning everywhere can State and National summaries and comparisons among communities and among States attain the comparability we all desire.

Mr. ELLIOTT. Dr. Derthick, right at that point, I have observed that much of this data kept by the different States by trained statisticians and technicians in that field can actually be compared if you have the time to employ people to go into it and make the comparison; so that is a field, I should think, in which a great deal of this money might be required in actually making the comparisons as to what is being done in this State, though their recordkeeping is a little different from what it is over here in another State.

Mr. DERTHICK. Yes; and part of this process is to supply these trained technicians which they do not now have in all too many cases, and as a result their studies are not as reliable as we would like them to be.

Then another part of the process is to implement the use of standard terminology and classification so as to insure the fact that the information will be comparable.

Mr. ELLIOTT. I certainly, so far as I am concerned, want to go on record in support of a system of statistics and information of that nature to be kept by the United States Office of Education that is available to the people of the United States and very closely up to date. I see no reason why it would not be to the great advantage of the Nation to collect these statistics and disseminate them and keep that right closely up to date. That kind of material should never be more than a year behind; should it?

Mr. DERTHICK. Mr. Chairman, I cannot tell you how heartening it is to hear you say that because for 90 years the Office has been frustrated about this problem, and you are exactly right, this information needs to be right up to the minute. I am glad that this part of our program is not being lost sight of as we relate it to all of these other important aspects, and I think that we are indebted to the national emergency and national interest in education for bringing to light this great weakness from which the country has suffered for so long.

The Office is now engaged cooperatively with State departments and national organizations, at their request, in a program to improve the quality of educational data. Handbooks have been prepared for the establishment of uniform records and terminology in certain areas. They are: Handbook I, The Common Core of State Educational Information, published in 1953; and Handbook II, Financial Accounting for Local and State School Systems, published in 1957. Work is now in progress on Handbook III which will standardize accounts and terminology for school property.

You see, this work that we have so recently done falls right in a very timely way with this program.

In light of what needs to be done, Mr. Chairman, the bill would authorize grants covering one-half of the cost of State educational agency programs, up to $50,000, to improve and strengthen the adequacy and reliability of State and local educational statistical data, as well as the methods for collecting and processing such data and disseminating the information.

Again, Mr. Chairman, the State submits its request on the basis of a State plan. The State decides what it needs to do, not the Federal Government. It may want to spend the money for machines. It may want to spend it for personnel. It may want to invest part of it for training conferences in the field to train people in local school districts in how to do their part, but it is up to the State to decide how they will invest this money in order to strengthen the program.

Mr. ELLIOTT. I note that the cost is estimated, even in the fourth year, at not more than $2 million.

Mr. DERTHICK. That is right. We could not make a better or more timely investment for education in this country.

I would like to conclude, Mr. Chairman, by a very brief reflection on the basic concepts which guided us in shaping this proposed Educational Development Act of 1958 and how these concepts support and nourish the hopes and aspirations which we share with our fellow educators and with all good citizens who look forward to a better tomorrow through education and the promise of youth.

We believe we have offered an effective approach to those critical areas of shortage and neglect that now carry the highest priorities in the national interest—in the teaching of science, mathematics, and languages. We believe, too, that in the related sequence of testing, guidance, scholarships, and fellowships, we have provided a formula which will go a long way in the continuing effort to conserve and develop our country's precious human resources. We are also proposing some measures which will buttress our responsibility to assist the States and local communities in providing the facts which will help us find the way to the solutions of our educational problems.

I am convinced, Mr. Chairman, that citizens every everywhere will be deeply impressed by the consistency with which we have applied, in this proposed program, the fundamental principle that education in our country is a State and local responsibility. In all sections of the program we have taken care to preserve and strengthen this principle. This has been achieved by placing upon the States and institutions the responsibility for designing and administering plans which will achieve our national objectives. Thus in the conduct of this program there would be a partnership with the States based on professional teamwork and understanding.

We are, therefore, looking forward toward State and institutional initiative in planning and toward State and institutional administration in execution.

Our Nation stands at a day in history when it must concern itself with the basic problems of survival. Great though our resources and productive capacity may be, we number only about one-fifteenth of the world's population. Our future lies in our capacity to marshal these human resources and to provide each individual with training of a nature and a quality that will enable him to attain his maximum potential. In our Nation we have always magnified the individual, and certainly in these times we cannot afford to neglect or overlook a single boy or girl in any nook or corner of the Nation, no matter how isolated.

This is the spirit in which our proposals have been conceived, and for this high purpose we urge the prompt enactment of our recommendations.

(The complete statement follows:)

STATEMENT BY LAWRENCE G. DERTHICK, UNITED STATES COMMISSIONER OF EDUCATION

Mr. Chairman and members of the subcommittees, I am Lawrence G. Derthick, United States Commissioner of Education.

I am most grateful for the opportunity to appear before you again; this time in support of our proposed legislation. We share your deep concern about the grave educational problems which we face today, especially in the light of international developments and in view of the heightened demands for trained personnel.

I should like to say in the beginning, Mr. Chairman, that in my considered judgment the best American schools are unexcelled. What is needed is to bring about wider application of the practices of our best schools and school systems. Essential features of the proposed legislation are designed to provide stimulus toward this end. Our aim is to stimulate and encourage concerted action on the part of the several States, thousands of local school districts, and the many private institutions—action in the interests of national security, which otherwise might be delayed by some of them, or not undertaken at all by others.

Secretary Folsom has outlined the legislative recommendations and their background. With your permission, we shall explain them, largely in terms of

the problems to which the proposals are addressed, and with a view to assisting the committee in developing supporting information for the record. To this end, Mr. Chairman, and as your deliberations continue, the resources of the Office of Education are at your disposal. We would be privileged to supply such additional information and to render such technical assistance as the committee may require.

Turning now to the proposals, we shall take them up in the order in which they appear in the bill (H. R. 10278). First, I should say that the programs authorized by the bill would be for a period of 4 years beginning July 1, 1958, except that scholarships awarded under title I and graduate fellowships awarded pursuant to title IV during the 4-year period would continue beyond that period to permit completion of the undergraduate or graduate training.

The programs authorized by the bill would be applicable to the 48 States, the District of Columbia, Alaska, Hawaii, Puerto Rico, Guam, and the Virgin Islands.

The proposed legislation, if enacted, would be administered within the Federal Government by the Commissioner of Education under the general supervision of the Secretary of Health, Education, and Welfare.

IDENTIFICATION OF APTITUDES AND ENCOURAGEMENT OF ABLE STUDENTS

Title I of the bill would provide assistance to encourage the States to develop and expand programs for the early discovery of student aptitudes, and for the maximum development of these aptitudes, through improved counseling and guidance services in the high schools. It would also provide an incentive to able students in need of financial assistance therefor to go on to college, through provision of a limited number of undergraduate scholarships.

Testing and counseling and guidance

It is clear, I believe, that the identification of able students who can profit from further education is an essential first step in developing the Nation's manpower resources. Early identification of the abilities of all students provides the high-school counselor and the students with information essential to them in planning their high-school programs and developing educational objectives. Test results and other personnel records enable counselors and teachers to advise and encourage students and their parents to make long-range educational plans. Regrettably, this is not being done, or certainly not being done as effectively as it should be, for large numbers of students today.

For illustration, in a study recently completed by the Office, entitled "Retention and Withdrawal of College Students," it was found that 32.4 percent of the 1,200,000 graduates of public and private secondary schools in 1950 entered college in the fall of 1950 as full-time students; and that an additional 11 percent continued their education on a part-time basis. One-half of the high-school graduates who stood in the upper half of their classes did not go on to college on a full-time basis, and one-third did not go to college at all. Of students ranking in the upper 30 percent of high-school graduating classes, 40 percent did not go on to college on a full-time basis, and 1 in 5 never enrolled in college.

Currently, with the assistance of a grant under the cooperative research program provided for by Public Law 531, 83d Congress, the University of Wisconsin is engaged in a study of the plans of high-school graduates of that State. A progress report of this study was made by Dr. J. Kenneth Little, director of institutional studies of that university, to your subcommittee, Mr. Chairman, when you held hearings in Eau Claire, Wis., October 28, 1957. Based upon the questionnaire returns of 34,000 public high-school graduates and defining the superior group as the top one-forth based on school grades, Dr. Little found that 27 percent of the boys and 35 percent of the girls indicated that they had no plans to continue their education.

We are concerned that this sort of thing is occurring all over the country. Lack of understanding of potentialities, lack of motivation to continue education beyond high school, and financial reasons account for the loss of most of the superior students who drop out of school before completing their education. In the interest of national security, it seems to me that we are compelled to take steps to reduce this waste of talent—lost or undeveloped talent, which we sorely need in order to meet the critical demands for scientists, engineers, teachers, technicians, and all other occupations where shortages exist.

Moreover, our concern is deepened by the fact that the needs of our expanding population in the years to come, estimated by some to reach a maximum of 250 million by 1980, must be fulfilled from a very restricted pool of young manpower.

Let me cite only one example which will dramatize the situation. In 1957 there were 2,303,000 18-year-olds. Twenty-three years from now in 1980, when it is estimated that our population will number 250 million, there will be fewer than 2,303,000 persons 40 years of age—an age at which it can be expected that many persons will have begun to assume leadership positions. This means, in final analysis, that there will be an almost inconceivable scarcity in the leadership age groups 20 to 25 years from now. I submit, Mr. Chairman, that we cannot afford less than the fullest possible achievement and contribution from our youth of today who will be our leadership of tomorrow.

Our democratic system of education stresses the essentiality of the greatest possible degree of free choice of programs of study on the part of individual students. The validity of this educational process depends upon the availability of adequate basic information for the use of teachers, counselors, other school personnel, and of parents and students. It also requires the services of qualified counseling personnel to aid in this process.

Tests designed to measure abilities and special aptitudes, when used in conjunction with student records and other information, are the most reliable method available for early identification. Many of our high schools and a few States do some guidance testing, but much of it is incomplete and not adequately followed up with individual counseling to make full use of the test results. Also, many schools have inadequate student-record systems.

Test results and other cumulative student data can result in good educational planning by students and their families, only if the facts are properly interpreted and utilized by the students and their parents. Yet it is estimated that not more than one-half the high-school students in the Nation are provided with the services of a well-rounded counseling program. Contributing to this situation is a severe shortage of qualified guidance personnel.

As might be expected, there is wide variation from school to school and from State to State in the distribution of counseling personnel employed, in the extent of counselor preparaton, and in the number of students which each counselor must serve. Altogether the Nation's schools now employ approximately 26,000 counselors, including both full-time and part-time personnel. In terms of full-time equivalents, there are approximately 11,000. The best current estimates put the need at approximately 15,000 additional counselors in the public high schools alone, if these services are to be provided adequately. Yet, in 1956, only about 2,500 graduate degrees were granted by institutions of higher education to serve all levels of education in guidance and personnel work. Also, it is known that not all of these entered education and that there is considerable turnover among counselors in secondary schools. The present yearly supply of adequately prepared counselors is little more than enough to meet current replacement needs.

A total of 41 States employ some personnel charged with counseling and guidance responsibilities. However, the State departments at this time generally are not staffed sufficiently to provide the professional leadership, consultative services, research, and publications which are required to promote the necessary expansion and improvement of guidance services in the local schools. The 41 State programs employ a total of only 63 persons, counting both full-time and part-time personnel, who are responsible for giving professional leadership for these services. A recent survey of the State departments indicated that the difficulty in providing adequate guidance services, at both the State and local levels, is attributed to inadequate staff, both in numbers and preparation, and inadequate financial support for these services.

A majority of the States have adopted certification standards for counselors and guidance personnel. At present 36 States, 3 Territories, and the District of Columbia have programs of counselor certification, 33 of which are mandatory and 7 optional. In a majority of the States these standards are minimum. Yet many persons providing counseling services do not meet the minimums for certification.

The comment is often made that every teacher knows the good students in the class. Thus the need for standardized and comprehensive testing and counseling is dismissed. It is not that simple: Getting high grades in a given course is not a reliable indicator of ability. Conscientious Mary may appear to be brighter than she is owing to her diligence. But lazy John, with unusual intellectual ability may mistakenly be thought to be less than average because he has never been motivated to work to his capacity. To identify effectively the talents of these young people and thousands like them, scientific testing procedure must be

used. Only after such reliable identification do the counselors and teachers have the tools necessary for proper guidance and counseling.

Just what is counseling and guidance all about? It is hard to describe in a few words, because it is a complex process and involves the entire counseling team—guidance and visiting teacher personnel, and school psychologist, as well as the classroom teacher and the administrator. Such counseling should dissuade lazy John from enrolling in courses that do not prepare him for continuing high intellectual effort in areas of his greatest aptitude. Instead, he would be encouraged to enroll in courses which are more appropriate to his ability—for example, trigonometry and physics. Thus he will be prepared for the college which he ought to attend. The demands that John will be required to meet continuously under a sound program of counseling and guidance will develop those habits of hard and careful work, which are basic to success in all human endeavors. What is true for lazy John and conscientious Mary applies in varying degrees to all of our boys and girls with their multiplicity of problems and needs.

Our legislative recommendations are designed to stimulate the development of a program of State and local action, which will provide the essential professional and administrative leadership in the State departments of education, adequate State supervisory services, and expansion and improvement of testing, counseling and guidance programs in local schools. We would expect not only to expand and improve the professional aspects of testing, counseling and guidance, but we would in addition encourage such services to penetrate the home and the community to a much greater extent than prevails today. We must identify talented youth early and utilize the school, the home, and the community to the maximum extent possible in motivating our children to acquire optimum education and training.

The administration of this program in the States would be carried on by the State educational agencies under plans to be approved by the commissioner. A State plan for testing and for counseling and guidance of high-school students would be approved by the commissioner if it met those conditions specified in the bill. One such provision would require administration of the plan by the State educational agency. Under further provisions, a State must include in its plan arrangements for the testing of students, for the maintenance of testing and other student personnel records, and for strengthening counseling and guidance services; and these are to be set forth in the State plan, along with the methods of conducting the testing, maintaining records, and strengthening counseling and guidance activities.

In addition, the bill would provide for grants by the Office of Education to institutions of higher education, for operation of short-term and regular training institutes to improve the qualifications for counseling and guidance work of personnel in the public or other nonprofit secondary schools engaged in such work.

While no specific sum is authorized to be appropriated for the testing and counseling and guidance programs, the order of magnitude of program costs which we believe to be necessary are estimated at $16,275,000 in the first year, increasing to $24,800,000 in the fourth year.

Undergraduate scholarships

We are proposing, Mr. Chairman, under the provisions of part B of title I of the bill a program of undergraduate scholarships which we regard as a key element of the comprehensive three-part program of testing, counseling and guidance, and scholarships, each part of which is aimed to encourage a higher proportion of the ablest high-school graduates to continue their education. I have already discussed the first two parts which would further this purpose by promoting the early identification of ability and the improvement of counseling and guidance services. Our broad objective is to reduce the loss of talent, potentially important to national security, caused when so many able young people drop out of school too early.

The proposal of a limited scholarship program fits into these provisions in two ways. First, the opportunity for scholarships on a competitive basis in itself would create a strong incentive for able young people to stay in school, work harder in academic subjects, and to prepare for college. Second, it would provide assurance that a lack of financial resources need not be the barrier to higher education for the most able boys and girls who have been stimulated to want to go to college by the testing, counseling and guidance provisions of the program.

We know, of course, Mr. Chairman, that your Subcommittee on Special Education for some months has been developing a very comprehensive record of

testimony on the availability and need for student financial assistance. It will be recalled that our Department has previously testified at length on this subject, and, I assume that it would not be your wish that we repeat that testimony. However, since testifying before the subcommittee in August 1957, we have completed a number of special studies and have developed other supplementary information which I should like, with your permission, to submit for insertion at an appropriate place in the record.

The supplemental material to which I refer contains summaries of recent research carried on in higher institutions through the cooperative-research program administered by the Office of Education under the provisions of Public Law 531, 83d Congress; summaries of recent national studies of the need for student financial assistance made by private organizations and institutions, a résumé of information, drawn from a study conducted by the Office of Education, of the availability of student financial assistance, which is now in the final stages of preparation for publication; a review of existing State scholarship programs; a summary of student financial assistance available from private resources; a study of the size of scholarships and the amount of currently available student financial assistance in relation to family income and to costs of attendng college; a comparative study of increases in tuition and fee charges in higher institutions; and a summary of the need for additional student financial assistance as reported by a representative group of higher institutions.

In our previous testimony we reported on a comprehensive survey conducted by the Office relating to the availability of institutional financial aid. These materials have been published as Financial Aid for College Students: Undergraduate, Bulletin 1957, No. 18, and Financial Aid for College Students: Graduate, Bulletin 1957, No. 17. In addition, the Office has more recently published two studies bearing on the problem of the need of student financial assistance. These are entitled "Costs of Attending College" and "Retention and Withdrawal of College Students." Copies of these publications can, if you desire, be furnished to members of the committee.

Our legislative proposal would authorize the appropriation of $7,500,000 for undergraduate scholarships for the first year of the program, and a like amount would be made available for new scholarships for each of 3 additional years. It is proposed that recipients of scholarships continue to receive stipends for a maximum of 4 years. Based upon the assumption that the stipends will average $750 annually, it is expected that the sums recommended will provide for 10,000 new scholarships each year reaching a total of 40,000 in the fourth year of operation.

We have given serious consideration to the determination of what should constitute a reasonable Federal effort in this area. The number of scholarships proposed will, we believe, provide a sufficient reward to high-school students who have been motivated to attend college and which, when added to institutional, State, and other financial aid available to students will assist in making a major contribution to the drawing into college of large numbers of worthy young people who cannot for financial reasons anticipate college attendance.

On the other hand, we believe the program is not so large as to discourage further scholarship assistance by institutions, States, and private donors. Nor do we believe that it will constitute an excuse for any withdrawal or diminution of existing scholarship programs.

The selection of individuals for scholarships would be made on the basis of ability and need by State commissions on Federal scholarships in accordance with approved State plans. Within the limits of a State's allotment, the Commissioner would award scholarships to individuals certified to him by the State commission. Applicants who were rated, on the basis of ability, above the last applicant receiving a scholarship and who failed to receive one solely because of lack of financial need would be awarded appropriate certificates by the Commissioner. Scholarships awarded under this program could be for any course of study leading to an undergraduate degree at any accredited institution of higher education, selected by the recipient, in any of the States or abroad.

I have referred previously to the small numbers of youth of college-going age in our country today. As a country, we cannot afford to permit the able and intelligent young people who are graduating from high school at this time to fall short of complete self-fulfillment. This is not only in the interest of the individual, it is in the highest interest of the Nation. We shall undoubtedly continue to face difficult and trying times, times which will impose upon us the need to utilize to the fullest all of the latent talent and ability which we can bring

to bear. The young people of today must provide our scientific and other leadership of tomorrow. We must, therefore, be concerned to build the broadest possible base of trained manpower. This may mean the essential difference between survival and disaster.

GRANTS TO STATES FOR STRENGTHENING OF SCIENCE OR MATHEMATICS INSTRUCTION IN PUBLIC SCHOOLS

As a preface to our testimony at this point, Mr. Chairman, it scarcely needs to be said that we have entered a new era—an era unfolding as a result of new knowledge of the universe and the continued development of new sources of energy. In many respects what recently was in the future, as conceived in the minds of men, is already here. We have been startled by recent developments and the accelerated pace with which the doors to nature's secrets are being opened.

In historical perspective, science in American schools has been of short duration. As late as 1825 college education was still centered upon the study of the classics. Natural science was considered of relatively little importance in comparison, except for mathematics. The United States was definitely lagging in technological education relative to Europe, where engineering had long been recognized as a profession. It is interesting to note that the introduction of the lecture and demonstration method in the chemistry course at Harvard did not occur until 1851.

The supplementation of lecture, textbook, and discussion methods in the teaching of science was followed by collections of minerals and of devices such as the air pump, barometer, or prisms which were shown and demonstrated. Later on, laboratory demonstrations were given by the teacher, and still later, the students were given opportunities to carry on experiments, but the student laboratory was not common in many schools until the turn of the century.

The relative recency of the entrance of the laboratory sciences into the curriculum undoubtedly is one factor limiting the character and degree of science offerings in the schools. Many of our schools never have had suitable laboratory facilities and in school after school the few science courses that are taught are often of a very inadequate nature, with instruction by teachers with less than desirable qualifications for the task. In recent years even the more favored schools have suffered sharp limitations on their science programs, as we shall show. These and other conditions have contributed to a critical imbalance in the curriculum, instruction, and student enrollment.

The proposed legislation is designed to encourage State and local school systems to correct the imbalance in education, by strengthening the sciences and mathematics, which has suffered similarly over the years. This emphasis is needed not only to enlarge our supply of scientists but to provide those students now in our schools—our future leaders—with a general understanding of these essential ingredients of the space age, so that they can comprehend the future promises, as well as the perils, of the age in which they live and make intelligent decisions each step of the way. Today most of the States do not have the leadership needed to promote the necessary modernization and upgrading of instruction in mathematics and science.

On the basis of our latest information, only 2 States (New York and Texas) have full-time supervisors in the field of mathematics, and 1 additional State (Connecticut) is recruiting for a person to provide this service. Only six States (Connecticut, Georgia, Louisiana, New York, Texas, and Virginia) have full-time supervisors in the field of science. The positions in two States (Georgia and Louisiana) have been filled only recently. Two States (North Carolina and Pennsylvania) have full-time supervisors with responsibility for both mathematics and science.

Resulting in part from lack of personnel, most of the States have not developed modern mathematics and science courses of study and teachers' guides. It is essential, we believe, that steps be taken to encourage the States promptly to incorporate new knowledge, new concepts, and improved teaching procedures in their programs. Immediate attention should be given to extending the depth and breadth of learning opportunities, and to revising elementary, secondary, and collegiate sequences of study, with a view to discarding obsolete content and adding the new.

In this connection, we invite your attention to the conclusion of Mr. Elbert P. Little, executive director of the Physical Science Study Committee:

"The teaching of science has changed, and changed substantially, in the half century, both in content and in technique. But on the whole, the changes have consisted in additions to the structure that existed 50 years ago, or in alterations to the existing structure. Lately there have been repeated intimations that this piecemeal reconsruction has long since failed in its purposes; that a new structure is now necessary; and that it must be designed from the ground up.

"The problem is seen most clearly in the secondary-school physics syllabus. Structurally it goes back to the early part of the century, and despite the adjustments of the past five decades it represents quite clearly the state out of which the science was even then beginning to pass" (p. 316, The Science Teacher, November 1957).

A number of factors contribute to the difficulties which school systems face in developing adequate programs of mathematics and science. However, let us consider the problem of the teacher. Certainly all of us would agree this is a prime factor. It applies in other fields, of course. But the shortage is considerably more severe in the fields of mathematics and science. Moreover, the preparation of those presently engaged in these fields is less adequate than in other subjects.

For example, one study of mathematics in California schools (July 1956) indicated that nearly one-third of the mathematics teachers in high-school departments did not have a college major or even a minor in mathematics. Nearly 25 percent of the secondary-school mathematics teachers in the District of Columbia are teaching without a major in the field. A recent report on the Teaching of Science in Illinois cites a similar problem. The report further points out that the higher salaries offered to college graduates in science by Federal and State agencies and by industry are a major factor in preventing the entrance of such trained personnel into the teaching profession.

The competition for teachers qualified in mathematics and science is definitely more critical today than heretofore. Several States which have conducted studies of teacher supply in science and mathematics report that only about one-third of the science teachers are full-time teachers of science and two-thirds teach these subjects merely on a part-time basis. Information drawn from 32 States indicates that in 1956 less than half of both the science teachers and mathematics teachers were devoting full-time to the subject. This situation is most common in small high schools.

People with the knowledge, aptitude, zeal, and teaching skill to inspire our youth have been even more restricted in entering mathematics and science than in other fields, where, unfortunately, shortages also exist. As a result, teachers, originally prepared to teach other high school subjects have been shifted to mathematics and science courses to the detriment of instruction in the latter subjects.

There has been an alarming drop in the number of science teachers trained annually. In 1950, 9,096 qualified science teachers graduated from our colleges. In 1956, only 4,320 were graduated, a decrease of more than 50 percent. A slight improvement over the latter figure was noted in 1957 when the number increased to around 5,000. Moreover, for a variety of reasons, of those graduates prepared to teach science only about 60 out of every 100 actually accept teaching positions. In contrast, more than 80 percent of those who prepare for elementary school teaching enter teaching immediately.

With regard to the competitive salary situation for beginning teachers in scientific fields, it should be noted that the median salary for beginning secondary schoolteachers in 1956 was $3,600 while the average beginning pay in industry for engineers, for example, was $5,200. There is a reasonably good chance of getting those who prepare for teaching to enter the profession, in spite of some salary differentials, but not when the difference is so great.

Added to the teacher problem is the poor condition of laboratories and equipment. Since laboratory equipment, particularly in advanced courses, constitutes a major expense, many schools have resorted to nonlaboratory methods of teaching. As a matter of fact, it is not uncommon to find a complete absence of laboratory facilities in the required general science and biology courses, to say nothing of those sciences requiring more complicated and expensive laboratory equipment.

For example, a recent report from one State (West Virginia) contains the following highly significant statement:

"Biology has been required by statute in our public high schools for at least 25 years, yet the facilities for teaching it are significantly lower than for any other high school subject covered by this survey. It would seem that, since every

high school graduate, in reality almost every student who completes the 10th grade, has one unit of biology, more attention need be given to equipping laboratories. It is difficult to draw any conclusion other than that this important life science is presented almost wholly as a 'read and remember' textbook course" (A Survey of the Educational Programs of the West Virginia Public Schools, Legislative Interim Committee, State of West Virginia, 1957).

A study of the physical condition of high school science departments in aonther State (North Carolina) in 1956–57 rated 58 percent of the 619 departments in "fair" or "poor" condition.

An analysis of the 1957–58 science deaprtment budgets for supplies and equipment in 18 secondary schools in Pennsylvania indicates an average allocation of only $1.12 per pupil. The highest amount budgeted was $3.30 per pupil and the lowest amount budgeted was only $0.30 per pupil.

Mr. G. R. Boyd of the Troy State College in an article entitled "The South Needs Science Teachers and Equipment" (Alabama School Journal, October 1957) writes, as follows:

"It is difficult to obtain accurate information about the science laboratory equipment in our southern high schools, but casual observation reveals that few schools have more than a fraction of the science equipment needed for a well-rounded program of science."

To stimulate immediate improvement in order to overcome this critical situation, the bill would authorize the appropriation of up $150 million annually for grants to the States to assist local educational agencies to expand and improve science or mathematics instruction in public secondary schools. Such programs, depending upon determination made by the States in their own State plans, may be used for (1) employment of additional qualified science or mathematics teachers, (2) increasing the salaries of science or mathematics teachers to make their pay more competitive, or to reflect additional work such as teaching in summer sessions, curiculum revision responsibility, and the like, (3) or for science or mathematics laboratory and related special equipment and minor remodeling of space used for such equipment, or (4) otherwise expanding or improving science or mathematics teaching in public secondary schools.

In order to encourage and assist the State departments of education to expand and improve their supervisory and leadership roles in the strengthening of science and mathematics instruction, appropriations would be authorized by the bill up to a maximum of $15 million annually for the duration of the program.

I would like to emphasize to the committee that these suggested approaches in dealing with the imbalance, which has been brought into sharp focus by the illustrations and studies I have cited, are not inflexible requirements. It is for State and local authorities to determine what elements of these proposals, or other measures, they will apply to achieve our common goal.

I am confident, Mr. Chairman, that the proposal we have recommended will enable the States and local communities to achieve significant improvements in the teaching of science and mathematics. I do not expect, of course, that everyone will agree with all elements of the proposal.

There are those who would question, for example, any special salary supplements for teachers of mathematics and science. Their reasoning has much merit with which I personally have a great deal of sympathy. Other things being equal, or in balance, shall I say, I would not make salary distinctions among good teachers of any grade or subject. Each good teacher is of paramount importance. But our national interest and national security are seriously at stake. We must take special measures to correct the imbalance and should the States and local school districts include in their plans some supplementation of salaries in the national interest, my hope is that simultaneously they would exert themselves vigorously to make appropriate adjustments in the salaries of others. Indeed, if precedent is a guide, this would be almost certain to happen in the course of developments.

In my judgment, this program is of monentous significance. In this connection, I am reminded of the statement Dr. James R. Killian made more than a year and a half ago in his testimony before a congressional committee. Dr. Killian expressed concern because we were becoming a nation of mathematical illiterates in an age when mathematics is an essential ingrediant for our very existence. The evidence since that testimony has only accentuated the merits of this reasoning. I can tell you that Dr. Killian is one of the stanchest advocates of a balanced program in education. I know he would be among the first to urge

that State and local boards and school administrators see to it that the balance is maintained.

With dedicated, well-trained teachers, an up-to-date curriculum, and laboratories up to the standard of both, science and mathematics would speedily attain their rightful stature in the secondary school curriculum.

FORELGN LANGUAGE DEVELOPMENT

Title III of the bill carries our recommendations for the development of modern foreign language teaching. In this connection, Mr. Chairman, it is quite clear that the leadership role of the United States in international affairs has placed upon this country extraordinary requirements for understanding and communicating effectively, both with our allies and with our potential enemies. Competence in the native language of our friends and foes has become essential for national security, as well as to facilitate all aspects of our international relations.

As a nation we are deplorably unprepared linguistically, either to defend ourselves in the case of war, or to exercise the full force of our leadership in the building of a peaceful world. A marked increase in both the quantity and quality of foreign language instruction is essential to America's welfare.

Some 3 million Americans, including members of the Armed Forces and their dependents, are reported to be living, traveling, and working overseas each year. Few Americans available for overseas assignments have had any foreign language training. Most Americans who do study languages seem to start too late and stop too soon to become proficient.

Education in this country is not yet preparing Americans effectively to live and serve overseas. There is evident need to improve American school and college curricula to prepare men and women to serve in the whole of the world. Until recently little attempt has been made to begin language-learning in American schools during the period most favorable for learning to understand and speak a second language. Traditionally we have waited until age 14 to 15. Then we have attempted the impossible by providing only 2 years on the average in high school or college for learning to understand, speak, read, and write a second language.

Of the 24 languages of the world each spoken natively by more than 20 million persons, only Spanish and French are studied by any appreciable proportion of American high-school students. Of the total enrollment in grades 9 through 12 in the school year 1954–55, 7.3 percent of the students were enrolled in Spanish and 5.6 percent in French. Over half of our high schools offer no modern foreign languages at all, many of which are, of course, the smaller schools.

On the basis of our latest available data (1954–55), less than 15 percent of the public high school population were studying any modern foreign language. It is estimated that not more than 15 percent of the 3 million students enrolled in our colleges and universities are studying foreign languages. Although a movement is underway to encourage the teaching of modern foreign languages in the elementary schools, and while some progress is being made, it is estimated that less than 1 percent of the current elementary school enrollment are receiving foreign language training.

The U. S. S. R. has moved ahead rapidly in language instruction. Besides maintaining special language schools, in which all the instruction in the upper grades is conducted in a foreign language, they require language study for 6 years in their 10-year schools. Russian university students are required to study a second foreign language which must be of a country in Asia or Africa.

In negotiations and activities conducted by Americans in foreign countries, we are constantly reminded of the language ability of the Russians who may be competing with the United States in such negotiations. We have frequent proof that entire Soviet delegations will be fluent in the native language of the country in which an international conference or bargaining may be taking place, in contrast to very limited language competence of the American delegation.

As an example, in the U. S. S. R., 40 percent of all high-school and 65 percent of all college students study English. In the United States, fewer than 10 public high schools out of a total of 25,000 and approximately 1 in 10 of our colleges and universities, offer Russian.

During World War II we had a demonstration of our linguistic unpreparedness when at tremendous cost we had to try to train men quickly in many languages. We need to take steps to insure that this situation will not be repeated.

The concern of the United States Government with the foreign language competence of American citizens today reflects the position of language as a matter of top priority in the national interest. Especially is this the case in our relations with nonwestern cultures.

Foreign language competence may no longer be defined as several years of study to achieve a reading knowledge. The requirement increasingly today is for Americans with the ability to communicate fully in a foreign language. We need those who can speak, write, and read, with particular emphasis upon the spoken language.

To initiate action to strengthen America's language capabilities, the bill would authorize a foreign language development program to improve the language competence of teachers now in service by the establishment of foreign language institutes. It would also provide for more adequate resources for training in the languages which are not now commonly taught in the United States, or not taught at all, by the establishment of foreign language training and service centers in institutions of higher education. Provision would be made also for surveys of the specific needs for the extension of foreign language instruction, research in teaching methods, and for the development of specialized training materials.

The fundamental objective is to improve greatly the quality of foreign language instruction at all levels of our educational system; to increase the number of languages that are readily available for study by American nationals; to deepen and extend the entire function of language instruction in American education; and to insure the type of foreign language proficiency by Americans that will enable them, whether in business, the professions, or government, to represent this country effectively in our global relationships.

In the 1957 Teacher Supply and Demand Report of the National Education Association, college graduates prepared to teach who had majored in the various subject fields were ranked according to the percentage of the total number of graduates who had majored in each subject field. Social studies led with 9.8 percent of the total, English had 6.2 percent, and foreign language was at the bottom of the list with 1.4 percent of the total college graduates who were qualified to teach. The number of college graduates prepared to teach who have majored in a foreign language has declined from 2,193 in 1950 to 1,525 in 1957, a decline of approximately 30 percent. In September 1956 the national supply of new high-school teachers of foreign languages was 25 percent short of the demand.

As a first step, the urgent need is to improve the language competence of teachers and supervisors now in service and to seek to stimulate the whole field of language instruction, as the bill provides, through the conduct of summer and regular session institutes strategically located throughout the country.

It is believed that top-priority attention must be given to Russian at both the high school and college levels, and that institutional resources and instructional materials must be developed for the teaching of such languages as Chinese, Arabic, Hindi, Farsi, Indonesian, and Swahili, among others, that are seldom taught in our colleges and universities. Chinese is now spoken natively by twice as many people (approximately 500 million) as natively speak English. Arabic is of high strategic importance in north Africa and the eastern Mediterranean; the Russian engineers now in Egypt, we are told, all speak Arabic. Hindi is the key language of India, and Farsi is used extensively from Iran through Afghanistan and northern India to Tibet. Indonesian is the developing language of Indonesia. Swahili is a key language in central Africa. These are simply examples to indicate the degree to which we must raise our sights to meet our language needs in the national interest.

Although relatively great progress was made in this country during World War II in establishing language and area training centers, there are today probably not more than 25 institutions of higher education in the United States which have the faculties and facilities that would make them suitable as institutions in which either language institutes or language training and service centers might be established. The expansion and strengthening of existing centers and the establishment of new centers are fundamental to the improvement of language instruction at all levels of education. The bill would provide for such centers.

A basic requirement, if progress is to be made in foreign language study and instruction in the United States, is to secure reliable data concerning the need for language training in all languages and for all categories of language users. We need definite information concerning the foreign language requirements of

the teaching profession at all levels, of American business and industry with foreign activities, of the professions, and of the various Government agencies directly involved in international affairs. Such information is not available today.

Also, extensive research is needed on the most effective methods in teaching foreign languages. Tremendous advances have been made in recent years in the development of electronic devices for language instruction, and continuing research is essential to carry forward these advances to new levels of usefulness to language instruction. The evaluation of methods of language instruction at each level of education—elementary, secondary, higher—requires additional resources if progress is to be made in adapting the best practices to our urgent current needs. At present such research is confined to relatively few language centers; it should be intensified and extended.

Research and development is likewise greatly needed in the basic tools of language study. The American Council of Learned Societies has stated recently that the United States had available dictionary and text materials for American use for only 4 of 30 important Asian languages. The shift in emphasis that must be made in foreign language instruction from simply a reading knowledge to proficiency in total language communication—to speak, to write, and to read a language—necessitates the development of large amounts of new language training materials.

Accordingly, the bill would provide for the Office of Education, directly or by contract, to study the need for increased or improved foreign language training, to conduct research on more effective language teaching methods, and to develop specialized teaching materials.

While no specific sum is authorized to be appropriated under this title of the bill, the order of magnitude of program costs which the Department believes to be necessary amounts to about $1.3 million the first year, increasing to $3.25 million the third year.

EXPANSION OF GRADUATE EDUCATION

Title IV of the bill contains the recommended provisions for expansion of graduate programs to increase the available numbers of highly trained individuals, from which we must draw our supply of fully qualified college teachers. Attention has been called repeatedly to the critical shortage of first-rate teachers in this country today. The need is great at all levels of education, and it is becoming increasingly pressing in the institutions of higher education. The colleges and univeristies will soon be flooded with students far beyond their present numbers, and they will, therefore, require greatly increased numbers of teachers.

To correct the shortage we must look to the source of supply. The main source of college and university teachers is our graduate schools. If we are to produce more and better college teachers, the graduate schools must do it. The graduate school, of course, is a major division of a university (occasionally of a college or an institute of technology) which provides courses of study leading to such degrees as the master of arts, the master of science, the doctor of philosophy, the doctor of science, and the doctor of education. It accepts as students only those who have been graduated from a college of arts and sciences or a professional school. Its purpose is to train teachers, research workers, and specialists.

According to the President's Committee on Education Beyond the High School—

"* * * more than 225,000 full-time and part-time instructional staff members serve in 1,900 colleges and universities, of which over 1,300 grant at least one kind of degree.

"A number of variables, including the speed with which enrollments rise, student-teacher ratios and the rate of faculty turnover, will affect the total needs for college teachers in the next several years. Taking conservative estimates with respect to these variables, somewhere between 180,000 and 270,000 new college teachers must be recruited in a dozen years—between 15,000 and 22,500 annually. Less conservative assumptions would indicate a considerably higher need" (p. 28, Second Report to the President, July 1957).

It will take more of an effort to find and train these teachers than is generally realized because today the graduate schools of our universities award annually somewhat less than 9,000 doctoral degrees. This degree represents the desired and standard preparations for teaching in college. It is to be hoped that in the

years ahead more students will receive it, but present trends are not reassuring. The output has been almost at a standstill for a number of years.

Among 829 colleges and universities questioned in a recent study (November 1957), it was found that 1,196 teaching positions remained unfilled. Thus we see that the higher institutions are already falling behind in their attempts to staff their classrooms.

Here I want to say a word about the qualifications of new full-time college teachers. Recent studies indicate a deterioration in these qualifications. For example, in 1953–54, 40 percent of all college teachers held doctoral degrees, but in this same year only 31 percent of the new college teachers had such degrees. Three years later the latter figure had dropped to 23 percent, which represents a serious loss, indeed.

The quality of new full-time college teachers is uneven as between the different subject matter fields. The deterioration is felt more severely in fields with which the Nation is now much concerned—science, mathematics, and engineering. In these the percentages of new full-time college teachers with the doctorate declined in 3 years by 40 percent and 30 percent, respectively.

A further indication of the deterioration in the numbers of fully trained college teachers entering the profession is to be seen in the changing sources of these teachers. When there is a deficit of well-prepared college teachers, such as now exists, the colleges tend to draw many of their new faculty members from the ranks of high-school teachers, from college graduates with little or no graduate training, from other educational personnel, and even from noneducational sources. While many such individuals render devoted and efficient services, their presence on college faculties in large numbers can only mean a deterioration in the general level of educational and professional leadership.

Let me indicate briefly what happens to those who complete their study in the graduate school and receive doctoral degrees. According to the President's Committee on Education Beyond the High School, no more than 5,000 of the 9,000 persons receiving doctoral degrees annually enter into college teaching as a career, and of these a considerable number are already engaged in teaching before receiving their doctorate. The President's Committee further expressed the view that "the cumulative deficit at the doctoral levelis an alarming prospect."

Thus the numbers of well-trained persons who are potential college teachers is eroded away and drained off into other fields of work. The shrinkage is worse in some fields than in others. In chemistry about 3 of every 4 persons holding the doctorate enter noneducational occupations, in engineering it is 3 out of 4, and in physics 3 out of 5. Industry, which prizes the fine talent assembled in our colleges and universities, is able to offer higher salaries than the colleges can pay, and therefore it skims much of the cream of academic scholarship, taking not only the promising young scholars but their professors as well.

Many of the graduate schools have few students because the schools do not have the resources to instruct larger numbers. Graduate education is costly. It requires extensive and costly library and laboratory facilities. The direction of graduate students is largely on an individual basis, which means that the ratio of teachers to students is necessarily high. Moreover, many graduate students have families for whom living accomodations must be made available. This heavy cost limits the number of universities that can offer acceptable opportunities for graduate study.

Consequently, today there are only some 163 institutions out of a national total of 1,856 that confer doctoral degrees based on graduate instruction. Of these, 69 are under public control and 94 are under private control. In the year 1955–56, 60 institutions each conferred fewer than 10 doctoral degrees, and 103 conferred 10 or more. Only a few—27 to be exact—awarded more than 100 such degrees. It appears, therefore, that a considerable potential exists for increasing the output of our graduate schools.

Now a word about the graduate student. He is a college graduate and, therefore, older and more mature than the college student. He has arrived at the point in life where he is concerned about earning money for the support of himself and, in many cases, for the support of a family. He has spent 4 years in college and also spent most, if not all, his financial resources. Three more years of study in an institution of higher education with a considerable financial outlay often presents a discouraging outlook indeed. The urge is strong not to continue further study, and by far the great majority of college students call it quits so far as pursuing an organized course of study is concerned. To be sure, a small number are not satisfied with a bachelor's degree. They see ahead an opportunity to increase their earnings through preparing

themselves for highly specialized intellectual work. They are also attracted by other advantages possessed by well-educated persons. But the number of such persons who continue their education to the doctorate is not sufficient to meet the needs of the Nation.

The fact is that today a very high percentage of graduate students receive financial assistance in some form to enable them to pursue advanced study; without such assistance the number of students would be considerably smaller than it is today. Financial support of graduate students is generally accepted as necessary in order to develop the trained manpower required by our society. However, such assistance is not available in sufficient degree to enable the graduate schools to resist the inroads upon potential graduate students by non-teaching professions and occupations.

The present proposal, which provides for grants to institutins and for fellowships to graduate students, is, I believe, one way to turn the tide which is running against higher education. It is a means of helping to produce more and better teachers for places where we need them most. True enough, it will not enable the colleges to offer larger salaries to attract teachers—other ways must be found to do that—but it will materially increase the supply from which teachers can be drawn. Surely, if we do not increase this supply, no amount of money for salaries will bring enough qualified teachers into the colleges; a sufficient number simply will not be available.

The bill would authorize grants to institutions of higher education to expand existing programs of graduate education and to initiate new programs. These grants could not exceed 50 percent of the costs of this expansion, and they could be used for additional or increased faculty salaries and other costs, including overhead and equipment attributable to the expanded or new programs. Under our proposal, no institution would receive an annual grant in excess of $125,000.

The bill would require that preference in awarding the fellowships would be given to students who are interested in teaching in institutions of higher education.

While no specific sum is authorized to be appropriated under the provisions of the bill, the order of magnitude of program costs which the Department believes to be necessary is estimated at $7,800,000 for the first year and would increase to $21,600,000 in the fourth year.

We would emphasize that the proposal leaves to the universities the responsibility for developing sound programs of graduate education. In administering the program, it would be our intention to ask of them one major question: How can we help you produce more and better college teachers? All we ask is that they provide sound programs of graduate education that are clearly related to the objective of preparing more college teachers.

IMPROVEMENT OF STATISTICAL SERVICES OF STATE EDUCATIONAL AGENCIES

The final program provided for by the bill, included under title V, is designed to strengthen our factual knowledge about the status and progress of education.

Office of Education required to collect statistics

Historically, the Office of Education was established in 1867 "for the purpose of collecting such statistics and facts as shall show the condition and progress of education in the several States and Territories * * *," and for other purposes. While other responsibilities have been vested in the Office, this original function has continued as basic.

Although the collection of statistics always has been a function of the Office, recent events have sharpened the critical need for further development of this role. Without exception, I believe, all users of educational statistics—State, local, and Federal agencies, the Congress, national organizations, and educational study commissions at one time or another have lamented the unavailability of adequate State and national statistics, or have criticized them as being incomplete or out-of-date.

The report of the Committee for the White House conference on April 6, 1956, complained about the situation and recommended that the States develop "adequate plans for the collection and dissemination of timely educational statistics." Again, on July 22, 1957, the President's Committee on Education Beyond the High School in its Second Report to the President made the following sharp criticism of the situation:

"We have been struck above all else by the astounding lack of accurate, consistent, and up-to-date facts, and by how little this Nation knows about its enormously vital and expensive educational enterprise in contrast to how much it knows, in great detail, about agriculture, industry, labor, banking, and other areas. We speak not of those difficult facts about education which can only be dug out by painstaking research but of those which are as susceptible to prompt and regularized reporting as steel output in Pittsburgh, potato prices in Maine, bricklayers' wages in Houston, hogs slaughtered in Chicago, and bank loans in San Francisco, all of which are reliably reported every month or every week by various Federal agencies. Until the gross deficiencies in educational reporting are remedied, all advisory work, all research, all educational planning throughout the country and all efforts by individual States, communities, and institutions to devise effective actions will be severely handicapped."

I pause here, Mr. Chairman, to ask how much longer are we going to be satisfied with less information about our children than we have about our hogs.

In view of such findings as these, and because of the urgent national need to know better where we stand and how to plan ahead, Secretary Folsom appointed an Advisory Committee on Educational Statistics. This Committee carefully explored the statistical procedures of the Office of Education and in its report to the Secretary and to me on November 23, 1957, made various recommendations for improvement, some of which are already being effected by the Office. As other groups had found before, the Advisory Committee reported that:

"A basic factor limiting the accuracy, completeness and timeliness of much of the data compiled by the Office of Education is its dependence upon intermediary systems of data collection, such as those maintained by State departments of education" and that "major improvements must continue to be sought in the statistical work of those in charge of compiling the data drawn upon by the Office of Education."

I believe it is perfectly clear, Mr. Chairman, that action must be taken to correct this situation. Yet to carry out this function in relation to the public elementary and secondary schools, the Office depends entirely upon voluntary cooperative arrangements with the State departments of education and the local schools. Excepting the small amount of administrative reporting required under existing grant-in-aid programs administered by the Office, no Federal law requires State departments of education to submit educational statistics or reports to the Office of Education, and no Federal funds are provided to the States for the provision of this national service. While we do not know the exact costs to a State department of education for supplying data to the Office of Education, the amount is considerable.

The demands for information by the Federal Government to show the condition and progress of education in the Nation are continually growing and it becomes increasingly important that such information be reliable and up to date. To provide it at all imposes a heavy burden on the State departments. To provide it promptly imposes an extra burden.

Not only are the States asked to furnish information for reports issued by the Office of Education at periodic intervals, but also for an increasing number of surveys at different times which seek to determine conditions and trends in various areas of education. In fact, the needs for data have increased these requests for information to the point of becoming almost daily routine. Some may require hundreds of man-hours of staff time for preparation, such as the basic statistical report on State school systems, while others may take only a few hours. As an example of the volume, a total of 11 single-time reports were requested during the period 1954–57. During the same time, there were 14 recurring annual reports, 2 biennial reports, and 4 reports which are requested on a periodic basis of 4 to 10 years.

One of these reports may require on a national basis data from 25,000 high schools, 50,000 school districts, or 1,800 colleges and universities and may call for days and even weeks of time on the part of staff in the State departments of education. Frequently, there is a time lag of many months, and even years in some cases, before many of the States respond. Some of the data are completely out of date long before we are able to make them available to the public and to other Federal agencies for planning purposes. To show the complete national picture, the Office of Education needs the reports from all States. If it does not receive a report for a 2-year period after it is requested, the published reports are liable to be nearly 3 years old. This obviously impairs the usefulness of this information.

Difficulties in obtaining data

There are two major reasons why State departments of education have been unable to expedite reports: Shortage of sufficient staff, and shortage of suitable equipment. Many departments are inadequately staffed to provide information needed by the Federal Government in addition to carrying on the regular services that they must provide their own State. Some of them are under great pressure frequently to provide information to their legislatures and to other individuals and agencies within their State for which the State staffs are paid, with the result, quite properly, perhaps, that the requests of the Office of Education frequently are put aside.

In addition to staff shortages, a number of States do not have the modern equipment needed to process quickly the materials for their own as well as for Office of Education reports. Few State departments of education are equipped for machine processing of their statistical data. Without proper equipment, the educational information needed on a nationwide basis scarcely can be expected to be made available within a reasonable time.

Improving reliability of data

Timeliness and reliability of information are equally important. The Office of Education must collect educational information with dependable meanings if it is to report properly to the Congress and the people on the condition and progress of education. Fundamentally, the reliability of educational data depends upon the general acceptance of uniform records and terminology. Only when items have the same meaning everywhere can State and national summaries and comparisons among communities and among States attain the comparability we all desire.

The Office is now engaged cooperatively with State departments and national organizations, at their request, in a program to improve the quality of educational data. Handbooks have been prepared for the establishment of uniform records and terminology in certain areas. They are: Handbook I, The Common Core of State Educational Information, published in 1953; and Handbook II, Financial Accounting for Local and State School Systems, published in 1957. Work is now in progress on Handbook III which will standardize accounts and terminology for school property.

While the individual States have provided staff time and funds in the development of these handbooks, they are now encountering difficulties in putting these accepted procedures into practice.

In light of what needs to be done, Mr. Chairman, the bill would authorize grants covering one-half of the cost of State educational agency programs, up to $50,000, to improve and strengthen the adequacy and reliability of State and local educational statistical data, as well as the methods for collecting and processing such data and disseminating the information.

While no specific sum is authorized to be appropriated, the order of magnitude of program costs which the Department believes to be necessary are estimated at $1 million in the first year and would increase to $2 million in the fourth year.

CONCLUSION

I would like to conclude, Mr. Chairman, by a very brief reflection on the basic concepts which guided us in shaping this proposed Educational Development Act of 1958 and how these concepts support and nourish the hopes and aspirations which we share with our fellow educators and with all good citizens who look forward to a better tomorrow through education and the promise of youth.

We believe we have offered an effective approach to those critical areas of shortage and neglect that now carry the highest priorities in the national interest—in the teaching of science, mathematics, and languages. We believe, too, that in the related sequence of testing, guidance, scholarships, and fellowships, we have provided a formula which will go a long way in the continuing effort to conserve and develop our country's precious human resources. We are also proposing some measures which will buttress our responsibility to assist the States and local communities in providing the facts which will help us find the way to the solutions of our educational problems.

I am convinced, Mr. Chairman, that citizens everywhere will be deeply impressed by the consistency with which we have applied, in this proposed program, the fundamental principle that education in our country is a State and local responsibility. In all sections of the program we have taken care to pre-

serve and strengthen this principle. This has been achieved by placing upon the States and institutions the responsibility for designing and administering plans which will achieve our national objectives. Thus, in the conduct of this program there would be a partnership with the States based on professional teamwork and understanding.

We are, therefore, looking forward toward State and institutional initiative in planning and toward State and institutional administration in execution.

Our Nation stands at a day in history when it must concern itself with the basic problems of survival. Great though our resources and productive capacity may be we number only about one-fifteenth of the world's population. Our future lies in our capacity to marshall these human resources and to provide each individual with training of a nature and a quality that will enable him to attain his maximum potential. In our Nation we have always magnified the individual and certainly in these times we cannot afford to neglect or overlook a single boy or girl in any nook or corner of the Nation no matter how isolated.

This is the spirit in which our proposals have been conceived and for this high purpose we urge the prompt enactment of our recommendations.

Mr. DERTHICK. As you see, Mr. Chairman, we feel very strongly right from the heart about these proposals.

Mr. ELLIOTT. I certainly perceive that, Mr. Commissioner, and I want to thank you and Mr. Richardson.

Will you name for the record the other gentlemen who were not called upon this morning?

Mr. DERTHICK. Mr. Melvin W. Sneed.

Mr. ELLIOTT. What is his title?

Mr. DERTHICK. He is head of the Laws and Legislation Branch of the Office of Education.

Dr. Conrad is the Director of our Statistical Branch, which is the largest single branch in the Office of Education.

Dr. Ludington is Assistant Director of Instruction in the State and Local School System Division and head of Secondary Education.

Dr. Blauch is Assistant Commissioner for Higher Education.

Mr. ELLIOTT. I want to take this opportunity on behalf of the committee to thank you and your assistants for the fiine and helpful information you have given us.

Though I realize the time is slipping away and we have a bill over on the floor of the House that I have to get over there and see about very shortly, I do have three questions I want to ask you, Mr. Commissioner.

Your bill says that need will not depend upon the tuition in the school of the student's choice. With the great range in the cost of tuition does that not tend, maybe, a little bit too much to tie the student to his home-town college, if there be one, or to the closest college to him?

Mr. DERTHICK. Mr. Chairman, I think we have not made sufficient use of our Assistant Secretary for Legislation this morning and I would like to hear him react to that.

I would be glad to answer, but I think that he will make a contribution of special nature.

Mr. ELLIOTT. All right, Mr. Richardson.

Mr. RICHARDSON. Mr. Chairman, we wanted to propose a stipend that would be high enough in the case of an individual who would depend substantially on the scholarship awarded to him to finance his education so that he could, with supplementation from other resources—borrowing or funds accumulated through summer work or

family resources—go to most any institution. We did not think it was practical to let the stipend be determined after he had selected the institution to which he would go.

In the first place, scholarships presumably would be awarded not later than the spring of the year since a large part of the purpose of them is to get students who might not otherwise decide to go on to higher education at all to make that decision.

As I say, we think that the amount would be enough to make it possible for a student who really wanted to go away to a high-cost institution to do so and yet, as indicated somewhere in the testimony, we thought that he ought to bring to the financing of his education some resources of his own.

On the other hand, as there may be some tendency to encourage students who would be normally dependent for the whole cost of their education on the amount of the stipend to stay relatively close at hand, we had in view the criticism that is sometimes made of programs of national scholarships, that they tend to pile up applications of the scholarship holders at the prestige institutions and we did not want, by putting the stipend very high, to aggravate that tendency.

It was a balance of that sort of consideration that brought us out where we are.

Mr. ELLIOTT. Do you feel, Mr. Richardson, after reflection and some testimony and all the welter of opinion that has been expressed back and forth about this matter in recent weeks, that about $750 is the proper amount from your viewpoint for a scholarship?

Mr. RICHARDSON. $750, Mr. Chairman, was the average figure we used in estimating the required appropriations.

The legislation specifies a maximum of $1,000. That, I think, we would still feel was adequate.

Mr. ELLIOTT. Your bill, secondly, provides for scholarships on a maximum basis of 4 years, if I read it correctly.

Yet, I understand that many of the scientific courses now, particularly some of the engineering courses, have been placed on a 5-year basis.

It is not, as I understand, a master's degree proposition, but it is a 5-year course for finishing in the undergraduate field in a particular course.

Do you think, since we are very greatly aware of our situation in the scientific field, that a modification of your bill might be in order to take care of that type of course, or do you feel that it will take care of itself in the due course of things?

Mr. RICHARDSON. I think, Mr. Chairman, we ought to take another look at that. I understand that only 7 schools of engineering out of a total of some 200 are entirely on a 5-year program at the present time, although 33 require 5 years for some of their curriculums.

It might create some complications to lengthen the period of scholarship in order to meet that situation, but I would not want to be dogmatic about it at this point and I think we ought to take another look at that question.

Mr. ELLIOTT. Do you agree with me that that should perhaps have some study with a view to conferences that we may want to have with the committee later?

Mr. RICHARDSON. I do; yes.

Mr. ELLIOTT. I am wondering about this situation: Might it be good to include students in your bill with good preparation in, or we will say a high aptitude for, modern foreign languages in addition to mathematics and science?

Maybe you would not want to answer that, but I would like to leave that for such thought as you might care to give it. I have the feeling myself that this modern language study is so closely interrelated to the problems in these fields of today that maybe it is entitled to actually more emphasis than any of us are giving it, and I would like to have you think about that in the same spirit as the previous question.

Mr. RICHARDSON. We would be glad to do so, Mr. Chairman, and certainly recognize the importance you attach to preparation and aptitude in those fields as well as in mathematics and science.

Mr. ELLIOTT. Again, may I thank you, Mr. Commissioner, and Mr. Secretary, and your assistants. This information you have brought us has been very helpful and it has been very well prepared and very excellently presented. We appreciate it very much.

Mr. DERTHICK. I can only repeat, Mr. Chairman, it is always a pleasure for us to appear before you and your committee.

Mr. ELLIOTT. Thank you, sir.

(Supplemental information furnished by the Department of Health, Education, and Welfare follows:)

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE,
Washington, April 4, 1958.

HON. GRAHAM A. BARDEN,
Chairman, House Committee on Education and Labor,
House of Representatives, Washington, D. C.

DEAR MR. CHAIRMAN: On January 27, 1958, we submitted to the Speaker a draft bill to encourage and assist in the expansion and improvement of educational programs to meet critical national needs through the early identification of student aptitudes, strengthening of counseling and guidance services in public high schools, provision of scholarships for able students needing assistance to continue their education beyond high school; strengthening of science and mathematics instruction in the public schools; expansion of graduate programs in colleges and universities, including fellowships; improvement and expansion of modern foreign language teaching; improving State educational records and statistics; and for other purposes. This bill was subsequently introduced as H. R. 10278 and H. R. 10279. Enclosed are some amendments to the provisions of those bills relating to foreign language centers which we should like to submit for your consideration.

In testimony before your committee recently on the above bills the Secretary and the Commissioner of Education pointed out the need for establishment of centers for the teaching of foreign languages where individuals trained therein are needed by government or by business, industry, or education and where adequate instruction in such languages is not readily available in this country. Further consideration of this matter by us has served to emphasize the need for establishment of centers to provide instruction not only in these languages but also in other fields necessary to a full understanding of the language, culture, and characteristics of the area in which the language is commonly used, such as economics, history, linguistics, geography, political science, sociology, and anthropology.

Some 3 million Americans, including members of the Armed Forces and their dependents, are reported to be living, traveling, and working overseas each year. Few Americans available for overseas assignments have full knowledge of the countries in which they serve. Moreover, education in this country is not yet preparing Americans effectively to live and serve overseas. There is evident need to improve American school and college curriculums to

prepare men and women to serve in the whole of the world. The enclosed amendments would assist in meeting this need.

The enclosed amendments would provide for Federal financial participation in the cost of instruction in these related fields necessary to a full understanding of the language, culture, and characteristics of the area involved, as well as in the foreign language itself, when a foreign language center is established with our assistance under the bill and instruction in such related fields is also not readily available.

Also enclosed is a statement of cost estimates and personnel requirements which would be entailed by the enactment of the measure.

The Bureau of the Budget advises that it perceives no objection to the submission of the enclosed amendments to your committee.

Sincerely yours,

ELLIOT L. RICHARDSON,
Acting Secretary.

AMENDMENTS TO H. R. 10278 AND H. R. 10279

1. Amend subsection (a) of section 302 by striking out the second sentence and inserting in lieu thereof the following:

"Any such grant or contract may provide for instruction not only in such foreign language but also in other fields needed to provide a full understanding of the areas, regions, or countries in which such language is commonly used, to the extent adequate instruction in such fields is not readily available, including fields such as history, political science, linguistics, economics, sociology, geography, and anthropology. Any such grant or contract may cover not more than 50 per centum of the cost of the establishment and operation of the center with respect to which it is made, including the cost of grants to the staff for travel in the foreign areas, regions, or countries with which the subject matter of the field or fields in which they are or will be working is concerned, and shall be made on such conditions as the Commissioner finds necessary to carry out the purposes of this section."

2. Subsection (b) of section 302 is amended to read as follows:

"(b) The Commissioner is also authorized, during the period beginning July 1, 1958, and ending with the close of June 30, 1962, to pay stipends to individuals undergoing advanced training in any foreign language (with respect to which he makes the determination under clause (1) of subsection (a)), and other fields needed for a full understanding of the area, region, or country, in which such language is commonly used, at any short term or regular session of any institution of higher education, including allowances for dependents and for travel to and from their places of residence, but only upon reasonable assurance that the recipients of such stipends will, on completion of their training, be available for teaching a foreign language in an institution of higher education or for such other service of a public nature as may be permitted in regulations of the Commissioner."

3. Section 303 is amended to read as follows:

"SEC. 303. The Commissioner is authorized, directly or by contract, to make studies and surveys to determine the need for increased or improved instruction in foreign languages and other fields needed to provide a full understanding of the areas, regions, or countries in which such languages are commonly used, to conduct research on more effective methods of teaching such languages and in such other fields, and to develop specialized materials for use in such training or in training teachers of such languages or in such other fields."

4. Amend the heading of section 304 to read "National Advisory Committee on Foreign Languages and Area Studies" and amend the second sentence of subsection (a) of such section to read as follows:

"The members shall be selected so as to provide a broad representation from among persons who are recognized for their knowledge or interest in various foreign languages and studies of foreign areas, institutions of higher education engaged in providing instruction in such matters or training teachers therein, and the general public.

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Amendment to Educational Development Act of 1958

Legislative proposal	1959	1960	1961	1962	1963
Appropriation requirements:					
Area studies centers	$875,000	$1,385,000	$1,385,000	$1,385,000	
Administration [1]	$243,000	$411,000	$411,000	$411,000	$60,000
Man-years	11	14	14	14	8
Estimated expenditures:					
Program costs	$525,000	$1,735,000	$1,385,000	$1,385,000	
Administration:					
Personal services	57,080	82,995	83,590	83,590	$51,820
Other	131,270	302,005	327,410	327,410	88,830
Total	188,350	385,000	411,000	411,000	140,650

[1] Includes $150,000 in 1959 and $300,000 in subsequent years, for contractual services for conduct of studies and surveys.

Tomorrow we meet at 10 o'clock.

Mr. Rodger Over will be our witness and then our next meeting following that, because of various interruptions we have, will be on Wednesday, February 26, at a time when Mr. Robert Goheen, president of Princeton University, and Dr. Henry Chauncey, president of the educational testing service of Princeton University, will be our witnesses. The next witness is Dr. Edward Teller of the University of California who will be with us on March 3.

Thank you very much.

(Whereupon, at 12:45 p. m., the hearing was recessed until 10 a. m., Thursday, February 20, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

THURSDAY, FEBRUARY 6, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION OF THE
COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10:16 a. m., in room 429, Old House Office Building, Hon. Carl Elliott presiding.

Present: Representatives Elliott (chairman of the subcommittee), Green, McGovern, and Nicholson.

Also present: Representatives Wier, Landrum, Thompson, Udall, Holland, Teller, Gwinn, Holt, and Frelinghuysen.

Staff members present: Fred G. Hussey, chief clerk; John O. Graham, minority clerk; Charles M. Ryan, general counsel, Kennedy W. Ward, assistant general counsel; Russell C. Derrickson, chief investigator; Mary P. Allen, subcommittee clerk; and Robert E. McCord, clerk, Subcommittee on General Education.

Mr. ELLIOTT. The subcommittees holding hearings on the important bills before them dealing with scholarships and other items will be in order.

We are most happy to have as the first witness today Dr. Lee A. DuBridge, a distinguished physicist and scientist who since 1946, has served as president of the California Institute of Technology.

We are happy to have you, Dr. DuBridge, and you may proceed in any manner that you desire. If you have a written statement and want to read it, you may do that. If you want to summarige it, you will be at liberty to make your own rules for testifying.

STATEMENT OF L. A. DuBRIDGE, PRESIDENT, CALIFORNIA INSTITUTE OF TECHNOLOGY, PASADENA, CALIF.

Mr. DUBRIDGE. Thank you.

Mr. Chairman and members of the committee, I do not have a written statement to give you. I thought I would summarize generally some of my thoughts in the field of higher education, pinpointing some of the topics which I think are of importance and which exhibit some of the problems which higher education faces today, and then at the end to outline my thoughts on what actions the Federal Government might take or in what areas the Federal Government might take an interest.

I prepared a statement and presented it to the Senate Committee on Labor and Public Welfare a few weeks ago, and I will say somewhat the same things to this committee as I said to the Senate committee, though, for the details, the transcript of my testimony there, of course, is available to you if you wish it.

I like to think of higher education as consisting of 4 areas or 4 problems or 4 fields of endeavor, each of which involves its own problems.

In order to have a system of higher education, you must, of course, have certain buildings and facilities, the campuses of the institutions of learning. These are the obvious, evident, and visible physical things one sees. One often forgets, however, that inside of the buildings there must be equipment, there must be books, there must be all of the paraphernalia that might be needed for any particular subject for the process that goes on inside the building.

We sometimes neglect the insides of the buildings when we are talking about the buildings themselves.

It was said when the Yale Library was dedicated a number of years ago, and it was a handsome building with fine architecture on the outside, but the librarian kept insisting, "Gentlemen, the library is inside the building."

What is inside the buildings is an important as how they look on the outside.

Now, the problem of providing buildings for higher education is a very serious one. I do not know whether it is a problem which the Federal Government can participate in or not. My general feeling is possibly the Federal Government can make, if anything, a small contribution toward solving the problem of providing the physical buildings, the laboratories, and the classrooms needed in our colleges and universities.

The States, of course, are providing through the tax funds buildings for the State institutions. The private institutions face very desperate difficulties in supplying private funds in building the buildings they will need.

As one looks 10 or 12 years ahead and sees the number of young people who are coming of college age during these coming years, one can easily see if we keep the same fraction of our young people in college as today, the same fraction, that the enrollment in our colleges and universities will be from 75 to 100 percent greater in 1970 to 1972 as it is today.

If the fraction increases, and it has been increasing steadily for the past 50 years, if the fraction of our young people who want higher education increases, then the enrollment problem would be that much worse. There would be that many more young people wanting to go into our colleges and universities.

So it is clear, it seems to me, that the physical facilities for higher education must be adjusted to approximately a doubled enrollment by 1970.

In the State of California we face an even more severe problem, because of the immigration into the State and due to the high percentage of young people now in the State, it appears that the enrollment in higher education in California will probably triple by 1970 to 1972.

Now, you can see, aside from all other problems, just the problems of providing physical facilities for this enrollment is a very serious one from a financial point of view. And the private institutions are facing probably their most serious problem in endeavoring to meet this rising enrollment.

One can say, "Let the States take care of the increase and private institutions stay where they are in size."

This is what is happening: That the private institutions, by and large, are maintaining approximately present or slightly increased enrollments and it will be the State institutions which will have to take care of the great proportion of the increase. Whether one regards this as a good or bad thing depends upon your point of view. I think it would be very unfortunate in this country if State universities and colleges predominated in the picture and the private institutions became a negligible or a very small part of the picture because I think you all recognize that the private institution has played a very important role in higher education in America. Up until a few years ago private higher education took care of about half of the students in colleges and universities.

That fraction seems to me to be bound to decline. Even now in California it is only more like 20 percent rather than 50 percent and the indications are in 1970 or 1972 the private institution may be accommodating only 12 to 15 percent of the students.

This may not be bad, but I simply point out that the numerical place in higher education of the private institution seems to be declining.

I do not believe, however, that this necessarily means that its importance will go down in the same ratio, because I believe that the private institutions, many of them smaller than the larger State institutions, can still exhibit a flexibility, can still make an emphasis on quality, can still do experimentation and try out new ventures, which may still provide a leadership to higher education generally, in spite of the fact that their numbers may be smaller.

So, I personally am not gravely concerned about the climbing fraction of our students who are in private institutions, but I am concerned that our private institutions remain lively, remain strong, remain vital, be encouraged to continue their experimentation, their new ventures, and especially be encouraged and made possible for them to continue emphasis on high quality education, to impose to the highest standards for administration and to impose the highest standards for graduation.

This, then, is all I want to say on the subject of physical facilities, although I said a little bit more than purely a problem of physical facilities. It is a serious and a growing problem.

The next thing an institution needs, of course, is a faculty, a group of teachers, and in the field of higher education it is absolutely vital that the teachers be scholars, that they be thoroughly prepared in their subjects. It is, of course, possible, for almost anyone to teach in the lower grades, as far as subject matter knowledge is concerned. But when one is teaching at the college level, special preparation, scholarly preparation is absolutely essential if one is to have good quality education.

Now, obtaining adequately trained teachers for higher education is a second serious problem and because of the rising enrollment is a problem which is getting even more serious every day. This problem is especially exaggerated today in the field of science and engineering, because of the tremendous demand outside of higher education for the same kind of people with the same training. The great research laboratories of industry and government today re-

quire men with doctor of philosophy degrees in physics, mathematics, chemistry, and in the various fields of engineering, precisely the same types of people that are needed for teachers in our colleges and universities, and the competition for the best people, for the best minds, between industry and higher education is extremely severe.

So it turns out that the young people who have just completed their doctor of philosophy degrees and are deciding where to go face a real dilemma, shall they go into industry at a starting salary which often may be of the order of $10,000 to $12,000 a year for a fresh doctor of philosophy in physics or engineering or shall they instruct an instructorship or an assistant professorship in a college or university at possibly $6,000 or $7,000 a year?

Now, this is obviously a difficult decision to make, so, the ones who accept the lower salary are the ones who have in them this burning desire to be teachers, and there are a number of them and our colleges and universities are depending upon the ones who have such a burning desire to teach and be in a university atmosphere that they are willing to make this sacrifice in monetary income.

I think it is not fair to ask them to make so great a sacrifice and I think we are all faced with the fact that not enough of them can make it, with their families and their other obligations, they feel they cannot take that sacrifice in income. Furthermore, the young person has not really learned yet the thrill of teaching for the thrill of being in a university atmosphere so he does not know how to evaluate the advantage in his life of being in a university rather than an industrial atmosphere. So he cannot make up his mind really adequately as to which kind of life he would prefer.

Therefore, securing adequately trained faculty members is the second major difficult problem.

The problem varies from one institution to another. It varies from one field to another. There are certain fields in which the shortage is not so severe. But in the fields of science and engineering, which are the ones I am most acquainted with, I assure you that the shortage is critical. In certain institutions and certain areas of the country where industrial competition is especially keen, the shortage is getting close to a disaster, simply because there are not enough adequately trained people to do the teaching in our colleges and universities.

That is a second problem which higher education faces.

The third problem is a matter of students, and here one faces a rather curious paradox. The number of students, as I have said, approaching college age, is growing very rapidly because of the high birthrates in the 1940's and since. The number of 18-year-olds coming of age each year is steadily rising because the birthrate took a sharp upturn after the depression of the thirties, entering the war years of the forties.

So, on the one hand, the colleges are faced with this dilemma: We have too many students. On the other hand, every investigation I know of which has been made shows also that there are very many able students who never get the opportunity to attend an institution of higher education at all.

Why is that? There are many reasons. Sometimes in rural areas and areas in the poorer States, in going to rural high schools they

simply never learn of the opportunities available to them if they do attend a college or a university. It simply never occurs to a young boy from the farm, possibly, that he should do anything after completing his high school except go back to the farm. Therefore, there are many young people of potentially great ability who simply do not have the opportunity of hearing about the opportunities in higher education and never have an opportunity financially to make the grade.

The financial barrier between youngsters obtaining a higher education is also widespread. It has been estimated that even of the upper 10 to 20 percent of our young people in high school, upper 10 percent in intellectual ability, that 30 to 50 percent of them, even, do not go on into higher education.

So, while we have a flood of students facing us, on one hand, we are still faced, on the other hand, that some of our best students in this country are not being encouraged, not having the opportunities of getting into colleges or universities.

Sometimes it is lack of hearing about the opportunity, lack of knowledge about it, because of home environment, or school environment, and sometimes it is financial, and sometimes it is simply a matter of motivation.

A young high-school boy can quite often get himself a quite good job out of high school and it may not occur to him that there is any reason for going on to a college or university even though he has the ability. Or it may be that he lives in a community or has got in with a gang where intellectual attainments are not highly regarded and there are many areas, many local areas in this country, even in many homes, even in many schools, where intellectual attainment is not particularly encouraged. In fact, in many cases it is just the opposite: The egghead is a despised person, and in many fields the egghead is regarded as anyone who has gone beyond the 12th grade.

So this anti-intellectual atmosphere, which is found in a number of places, in a number of communities, to a certain extent, in this country is sometimes a discouragement and prevents a student, having the desire to make full use of his intellectual talents.

Now, it seems to me that the intellectual talent of the country is a national asset, of very great and possibly even of very grave importance. There is no question but what we are in today in an intellectual contest with the Soviet Union. The fact that the Soviet Union was the first to launch a satellite does not mean that their educational system is necessarily better than ours, because we launched a satellite a few months later. But the two satellites have forced us to look at the educational system of the two countries and to ask ourselves, "Is our educational system as good as it could be," because whether it is sputnik or something else, we are clearly in a contest with the Soviet Union, in a military sphere, in the economic sphere, in the contest for world markets, in the contest for world leadership, in the contest to try to prove that a democratic way of life is a better way of life than the Communist way of life, and we are trying to prove this to all countries in the world. And the proof of this will lie eventually in the welfare and progress of our people and of the progress of our country and the welfare and progress of our people and country depends on how smart we are and how smart we are

depends on not only innate qualities of intellectual power our people have, but how well they are trained, how well they are developed and how they are utilized.

So this intellectual contest is a very grave and important contest. It is the great contest of this century to show that we can progress in our areas faster and better than the Soviet Union.

I am not one who advocates adopting Soviet practices in education or anything else, but I am one who says we should look at our system and ask under the democratic system are we doing the best it is possible to do, to find the best brains in our population and to give those brains the best possible development and make the best possible use of them.

So I think this question of finding the best students and helping them get motivated and helping make it possible for them to get the maximum education of which they are capable, and for which they have the ambition is a terribly gravely important issue in modern America. And so I regard the question of the students and what we do with them as a third area of problems in higher education.

Finally, you can have buildings, students, and faculty, but you have to have also an educational program, an education philosophy, a point of view, a general goal and objective for your system of higher education.

Now, in Russia the goal of the system of higher education is very simple. It is to train technicians to serve the needs of the state. When you have a simple fixed goal of that sort and a dictatorial state which can carry out the goal it is very simple to decide what to do. You impose rigorous requirements on your students, but when you have found intellectually able students you pay them, you pay them handsomely to go to college, to complete their education. When they have completed their education, if they qualify, if they are good, you pay them handsomely to come into the service of the state.

So, both through dictatorial methods and, paradoxically, through capitalistic incentives, namely, high salaries, the Soviet Union is able to force through a very large production of scientists and engineers, and they are intended to meet the needs of the state and they must serve the state. On the other hand, they are given handsome incentives and handsome rewards if they do serve the state well.

In America our objective, our program, goals, and ideals are very different. Our system of education is to give intellectual development and freedom to 170 million people. Our education system is aimed at the development of the individual, not to the service of the state. We feel that if we have 170 million people that the state will also be well served because these people will have the patriotism, and the state will have the mechanism of such of their services as it may need. But the primary objective of our system of higher education is to develop free minds of individual people. If that is your objective you have a very different system of education and you meet the problem in a very different way. You meet it simply by providing the opportunities as widely as possible throughout the country. You meet it by stimulating the students in as many possible ways to develop their own faculties as far as possible and to the maximum extent possible, and you do it, I trust, by rewarding those who do a good job in their

higher education and then go into intellectual pursuits or other pursuits and serve the country and the people through their knowledge and their intellectual ability. In other words, one also should reward intellectual attainments and intellectual achievements as well as encourage their development.

This has been the objective of American higher education from the date when Harvard University was founded over 300 years ago and ever since.

As our frontier moved to the west, every community soon saw the need for an academy or a college, or, later, a university, and it established that college or university and set it up to meet its needs. In the Middle West the needs were needs in the fields of agriculture and teaching and the needs of the church, and so the preacher, the teacher, and the farmer were the primary goals of colleges of the Middle West originally as they were founded. But each generation and each area has been transplanted to the oriental country, whether or not it fits the desires of its own people. So, we have built in this country an educational system which does fit the needs of the people and has been established and designed to assist people in developing their own intellectual interests and abilities.

So, I think we have in this country a system of higher education which is far better fitted to the needs of our country and its people than any other system in the world.

I have had the opportunity of traveling in a lot of countries in the world during the past 2 or 3 years and looking at their colleges and universities and research centers of science and engineering. So, when I say I think our system of education is by far the best in the world, I mean it, and I think I can support that statement by comparison with any other specific country.

The reason is that our system of higher education has been built to fit the needs of the people and of the communities in a more perfect way than in any other country I have visited.

In many countries, particularly in the Orient, a European system has been transplanted to the oriental country, whether or not it fits the needs of that country, and frequently it does not.

In other countries, the objective of the system of higher education has been to train a very tiny fraction of the people for very specific callings or professions, and so only a quarter or a fifth or even a tenth as many of their students, relatively, go into higher education as in this country. We have built a system designed to train, to educate, to give opportunities to a very large percentage of our population, and it is doing that. When you build a system designed to give opportunities to a very large percentage of the population, there are certain sacrifices, of course, that you make. If we had built a system which was intended to accommodate only the upper 5 or 10 percent of our young people, as many systems in the world are, it would be a very different system. One could have different standards; one could confine the attention to only certain areas of intellectual achievement or intellectual development. One could do many things. But when one wants to give opportunities to a large number of people, you make certain intellectual sacrifices. Possibly we have gone a little too far in some areas in accommodating the large number of students; possibly in certain areas our standards are too low.

I think, indeed, it is time now for us to take another look at the standards we require for entrance and for graduation from our colleges and universities, because I think a little toughening process is probably now in order; we may have gone too far in lowering the standards to get in a larger number of students.

Now, with the rising flood of students we do have an opportunity of saying that we will not create room in our colleges and universities except for those who are determined to make the best use of these facilities and who have the intellectual capacity to make the best use. That does not mean we will turn away 90 percent of the students who try to get in, or even 50 percent, but, possibly, 10 to 20 percent of the students who are coming along who will now get in may well be told: "You are not adequately prepared. Your motivation is lacking. Your ambition is not adequately high. Your intellectual capacity is not adequate. You should go to some type of training school instead of a college or university."

We do not solve the problems of numbers by raising standards. We do not solve the problem, but we may help alleviate it.

I have been trying to describe the areas of difficulties and problems in our institutions of higher education, and the question is now, "What should be done at the present time?"

I think this last matter I have been touching on is probably our most difficult problem and our most urgent one, which is to try to lift the intellectual standards which we require of students entering and going through our colleges and universities. And I think this is the No. 1 task which the colleges and universities face, and I think they are facing it. I think most of them recognize that there is this task and are trying to do something about it and see in the opportunity of rising enrollment that they can begin to impose standards on the entering classes. Here one meets a problem that goes beyond the realm of higher education. To get an adequately prepared student entering your college, he must have had an adequate preparation in high school. And so our colleges are faced with the problem that, though they may impose standards as to what courses should be taken and what quality of performance should be demanded, they may find that the high-school graduates may not have had the opportunities for those courses or the opportunities to meet those standards, and this gets into a problem which is beyond the capacity of the colleges themselves to deal with fully because they do not have control of our public schools and of our high schools.

So, here is a problem which the colleges and the high schools must work together on and, possibly, this is an area in which the Federal Government can be of very great assistance in bringing together the problem of the college and of the high school.

The essential of the problem of the high school is that it must lift its intellectual standards; that it must go through a very severe toughening process in order to prepare those students, which have the intellectual capacity for it, for higher education, and so I think a general tightening up of our educational standards in high schools is a very important problem ahead of us.

How can we do this? First, I want to say that it is unfortunate to make too sweeping a generalization about our public schools, about our high schools. Our high schools, like our colleges, have one great and

important characteristic which we must never forget, the characteristic of diversity. There are enormous variations among all of our schools in this country, for the reasons I have mentioned, namely, they are adapted to the people, to the local communities, to the local taste and talents of the individual areas, but they do vary, and I think this is a fine thing, that we have big schools and little schools. In the higher education field we have small colleges and great universities. We have professional schools in all different areas. We have schools that are hard to get into and some schools that are easier to get into. We have some schools of very high intellectual standards. We have some schools, colleges, and universities of somewhat lower intellectual standards.

Theoretically, any single student could look around the country and find some institution among our 1,800 colleges, universities, and junior colleges that just fits his taste and talents and needs and ambitions.

Unfortunately, our students do not go to as much trouble as they should in selecting the school which is most ideally fitted to them, but the opportunity is there for a student who wishes carefully to consider his own talents and needs and carefully consider the various institutions to find one which ideally suits him.

Because of this great diversity, this great variation, it is very difficult to make sweeping statements. Almost any statement you make is subject to exceptions. One can say the intellectual standards in our high schools are too low. That would be true for a large number of the high schools. It would not be true for many, because we have some extremely fine high schools; some high schools, private and public, which maintain very high intellectual standards, which give students fine training, even in mathematics, physics, and chemistry.

I can assure you of this, because at the California Institute of Technology we admit only students who have had an exceptionally good preparation. We get applications from 1,500 students a year or so, completed applications from students who have completed the paper requirements in terms of courses and grades. Of that 1,500 we can only choose 180. We admit 180 freshmen only. Naturally, we take the best ones of the applicants. But, when we take those best ones, we find that they are young men that are superbly prepared. They have high intellectual ability, but they have, of course, also had good preparation in mathematics and science.

So there are schools who provide this preparation and there are individuals who, even in not terribly good schools, somehow, by their own initiative manage to get themselves prepared in the essential fields. So I do not want to condemn all of our public schools and all of our high schools by sweeping statements that their intellectual standards are too low because some of them are fine. But there are some that are too low and I am afraid it is true that the average high school is not maintaining the intellectual standards that it could and should and so we face a problem in this country of trying to lift the intellectual level of attainment in our high schools and, in trying to drive out the soft and the snap and the nonintellectual courses of study and substitute for them—courses which are really of intellectual caliber, which are tough, which are demanding, and which develop the intellect.

I think for example, too many high schools have neglected foreign language, mathematics, and science in their curriculums and have al-

lowed too many students to slide through to graduation without taking a tough, intellectually demand course.

So, I think that the high schools on the average need to face this problem and we need to see what we can do about it.

What could the Federal Government do in this area?

There have been many proposals, for example, to offer scholarships to promising students in high school so they can go on to college. I think the scholarship idea is a very important one for several reasons, because if properly administered and properly set up, properly conceived, it can help solve several of the problems that I have been talking about.

First, if a scholarship program is widely advertised throughout the country it can attract the interest of students who might not otherwise hear about college opportunities. It can hold up a goal to even the boy on the farm in a remote suburban area who would not otherwise hear about college opportunities. It will attract his attention, arouse his ambition, and he will ask himself, "Maybe I could qualify."

It will dig out the students of high intellectual capacity who now may not think about going to college or who may be prevented by financial barriers. So, it will serve as a motivation to many students and it will serve to reduce the economic barrier to many students.

To my mind, however, possibly the most important aspect of a scholarship program properly conceived is that if the requirements for winning a scholarship are properly set, if they include a stiff examination, let us say, and if they include requirements that the student shall have had some good tough subject, like mathematics, foreign language, and other things, then if there are a lot of students around the country that are going to compete for scholarships, they will demand of their high schools that they get these subjects and that they get a good training in them. If their parents will demand that the high schools offer these subjects and provide good training in them the teachers in the schools themselves will see to it that the subjects are offered and that students are encouraged to take them because it will be a matter of pride to every high school if 1 or 2 or 5 or 10 of their students each year can win one of these national scholarships.

I think, for example, the national merit scholarships which are privately financed by the Ford Foundation and by a group of companies are fine. They offer only 500 in the whole country, 500 merit scholarships each year, but 30,000 to 50,000 students compete for these 500 awards. Needless to say, the awards go only to the intellectually most capable and best prepared, but I think even this small number of scholarships has stimulated many schools throughout the country to improve the preparation of their students and to offer opportunities to their students and more and more high schools are offering summer courses, evening courses, special courses, to aid the students to get them more adequately prepared so that they have a chance of winning some of these scholarships.

If the Federal Government had a scholarship program in which not 500 scholarships are awarded each year but 5,000 or 10,000, or some number, and I do not know how large it should be, but many thousands were awarded on the basis of achievement, on the basis of merit, this would stimulate a rising intellectual standard in the public schools throughout the country, in a way which would not put the Federal

Government in control of the schools, would not put the Federal Government in position to dictate the curriculums of these schools, but would offer an incentive so the schools themselves would, as my friend, Dr. Rabbi said, "Get about the business of pulling up their socks," of improving their intellectual standards, and of helping their students choose to take tough and demanding courses. So I think a scholarship has this opportunity of offering incentives to enable our public schools to lift their intellectual level.

Mr. GWINN. Before you leave that, Doctor, I think the testimony shows thus far that the Federal Government is so afraid to set up standards that they are simply going to send checks around to the States.

Mr. DUBRIDGE. For scholarship purposes?

Mr. GWINN. Yes. Now, how are you going to create what you have been describing by simply adding more money to a school system that is already deficient? The scholarships would affect very slightly the total number of schools really. I do not see how without the Federal Government really getting into this and attempting to influence the subject matter of our education by offering a prize that you really are going to affect the situation much. It will simply mean that the boys who are now going to your institute and to other places get those scholarships. Plenty of them will get the number that we could possibly think of offering.

Mr. DUBRIDGE. Well, I think there are 1 or 2 remarks to make in response to this. Of course, I am not an expert on the administrative problems of how the Federal Government should initiate and operate its scholarship program. It seems to me, however, that it could be operated through the State.

For example, if Federal funds were made available to a State and the State were told this money is available for awards to students providing they pass certain intellectual standards in some kind of a testing program or a program which maybe the State itself can set up, but require that State to set up such a program that only the best prepared students in the State can qualify for these scholarships, and provide that whatever testing program is set up shall include tests in tough, difficult, intellectually demanding subjects, such as math let us say. Then I believe the States would be forced to set up tests or criteria for the awarding of these scholarships, which would encourage throughout that State the high schools to look at their own programs and ask, "Do we offer the proper preparation so our students have a fair chance in competing with other students in the State?"

Mr. GWINN. That is the real problem.

Mr. DUBRIDGE. It is.

Mr. GWINN. How are you going to get, politically speaking, the Federal Government, a political body, with ideas of patronage and all that, to exercise an influence without raising immediately a bigger objection than the influence is likely to be?

Mr. DUBRIDGE. Yes. While you are asking me a political question, I am a scientist. So I probably cannot give you an adequate answer.

Mr. GWINN. Suppose you are a scientist administering the scholarships?

Mr. DUBRIDGE. Yes.

Mr. GWINN. Of the Federal Government, and you are very definitely slanted toward math and science. Some of those farm folks out in Illinois and Iowa may say, "Well, you make scientists out of all of our boys, and maybe teach them political ideas that we do not like in the meantime. There will not be enough of the other folks to pick up the pieces around here after the shooting is all over."

Mr. DUBRIDGE. I certainly would not advocate——

Mr. GWINN. We have a deficiency of other kinds.

Mr. DUBRIDGE. We have a deficiency of other kinds making this scholarship—I like to call them prizes more than scholarships, scholarship prizes, let us say—I certainly would not advocate making them available only to those who want to go on to science or engineering. I would put no strings at all on them as to the field in which they wish to enter. But I would require that in competing for these scholarship prizes, in winning one of these scholarship prizes, they would have shown good preparation, good achievement in some intellectually demanding areas of study.

I think mathematics is a good example, and that if one required high achievement in mathematics, for example, then this would help lift the intellectual level in mathematics in the various schools. I think just lifting even that one subject would provide an intellectual tone to our schools which might help them look at other subjects and say, "Are we doing as well?"

I would not confine it to mathematics. I would say foreign languages, political science, history, these subjects also are important, English grammar, and I would require good achievement in these solid basic areas of study and not confine it to any single one. How you do that, I do not know.

I think, for example, the Federal Government could get some private organization such as the Educational Testing Service, to prepare a sample test which would be available to use. The States might not be forced to use this particular test but say this test or a comparable one should be used as a basis for choosing the award winners. Then one might be able to do what I am hoping for. It will not solve the problem. It is only a tiny step. It is only just a signal that tells the country that the Federal Government is interested in the brains of the people and their development and will give a tiny spark and stimulation and maybe the States will add to the money or adopt other measures which work in the same direction.

It is only a way for the Federal Government to signal its interest.

Mr. GWINN. Now you already signaled to this whole country the opportunities in your institute. In a sense you have done just what you are asking or thinking that the Federal Government might do. The same thing is true of many other institutes like yours; is it not? Most boys know about the possibilities in this direction. The trouble of it is we are not doing the job lower down. You have to find these boys way down.

Mr. DUBRIDGE. Right.

Mr. GWINN. Have you not?

Mr. DUBRIDGE. Of course.

Mr. GWINN. Some of them ought to go to the vocational or the engineering schools, the trade schools to start with, should they not?

Mr. DUBRIDGE. Of course, yes, sir.

Mr. GWINN. These tests, are they not going to do that?

Mr. DUBRIDGE. No. No, these tests are solely for the purpose of picking the top students of the country and giving them an opportunity to go into the colleges and universities. They do not touch the problem of vocational training; they are not intended for that, what I have in mind. That is another problem and will have to be tackled in some other way. But if we are anxious to pick the top, shall we say the top 10 percent, of our students in intellectual ability, the ones who can make the teachers, the engineers, the scientists, the top business and professional people, the Congressmen and Senators of the country——

Mr. GWINN. That excludes us certainly.

Mr. DUBRIDGE. If one would like to pick the best people in the country and try to make sure that they will get a higher education, this might be a little stimulus and at least work in the right direction.

Mr. UDALL. Will the gentleman from New York yield?

Mr. GWINN. Yes. I will yield.

Mr. UDALL. If I gather the point Dr. DuBridge is making, and to me it is one of the most interesting points that has been brought here to us, it is that a scholarship program not only will stimulate the student but will permeate the whole educational system with a new challenge, at the primary level as well as the secondary level. That is your point, is it not?

Mr. DUBRIDGE. That is what I would hope. Yes. I hope it is set up so it will do precisely that.

Mr. UDALL. So far as the standards and interference of the Federal Government with the National Merit Scholarship program, they have their technical setup. We might simply borrow their procedures.

Mr. DUBRIDGE. You could use somewhat the same procedure, yes. I do think, however, that the Federal program should be administered through the States. It is true that in the Merit Scholarships, the students in the richest States and best schools have the best chance. I think many States are inadequately represented in the Merit Scholarship contest, simply because their schools are not adequate. But by giving each State its own program, then every student in that State would feel he had a chance.

Mr. UDALL. Yes.

Mr. DUBRIDGE. And he would not be competing with students from richer States and have no chance at all.

Mr. UDALL. It would have the effect of galvanizing the whole existing plan.

Mr. DUBRIDGE. Yes.

Mr. TELLER. Mr. Chairman, will the gentleman from New York yield to the gentleman from New York?

Mr. ELLIOTT. The gentleman from New York yields to the gentleman from New York.

Mr. TELLER. Dr. DuBridge, are you not saying in effect, at least I gathered from it as an inference by conclusion, that the Federal Government should set up the standards for testing?

Mr. DUBRIDGE. I think that one comes close to this, and I realize the danger of this point.

Mr. TELLER. Why do you call it a danger?

Mr. DUBRIDGE. Because this would at once raise the fear that the Federal Government was attempting to control our school system.

As everyone knows our local communities have a jealous regard for their own independence and their own control of their own local school system, and I agree with this attitude that the local community should have the final say about its own school system. I do, on the other hand, feel that somehow the Federal Government can point to standards, can stimulate higher standards, suggest higher standards, can develop ways of measuring attainment, can encourage private organizations, for example, to develop tests for determining whether an individual has met or can meet high standards without imposing these standards by law or by edict.

It can say, "Here is a test that is useful," and the States could well use——

Mr. TELLER. As I understand your statement, it is to the effect that the proposal for these rigid standards comes close, as you put it, to require that the Federal Government should establish the standards. You reached that upon the grounds of principles as an educator. Then, on the other hand, you make a political observation or come to a political conclusion that it might be well to give some of it to the States. Your views as to giving some of it to the States, they are based on political considerations, are they not?

Mr. DUBRIDGE. Of course.

Mr. TELLER. They elude the basic proposals you make for these rigid national standards, do they not?

Mr. DUBRIDGE. I do not know. I am not sure.

Mr. TELLER. You are saying, on one hand—the reason I am led to ask this question—let me phrase it another way. You say that you want the national scholarship or prize program, one of the reasons that you say we ought to have it is that it will inspire the States and localities to bring their educational systems up to a standard, or a higher standard.

Now, is it consistent with that objective to give to the very States that now have these lower standards the administration of the scholarship program, the testing proposals, or the methods? Is that an effective way of bringing out your essential idea of raising the national standards by a scholarship or prize program?

Mr. DUBRIDGE. I think it would also be more efficient for the Federal Government to dictate, if it wanted to, what standards the schools should follow. But I do not think it is a democratic way in this country.

On the other hand, I have the feeling that every State, every State government, would like to have its schools good. It would like to have them as good as it could possibly make them. If the funds were provided to that State to offer a stimulus to its schools, I believe that every State would say, "This gives us an opportunity to reward our best students and to lift the standards of our schools." I think they would respond and do the best they could.

Mr. TELLER. Suppose the States did not do so?

Mr. DUBRIDGE. I think the Government could withhold funds from any State that declined to enter a scholarship program or declined to have any intellectual standards for their scholarships. I think certain minimum requirements could easily be imposed that a competitive examination or a competitive mechanism of some sort must be used to pick the best students. But no State would decline that, I would think.

Mr. TELLER. We find some surprising things happen in Federal-State relations, particularly in the field of education.

Mr. DUBRIDGE. I see.

Mr. TELLER. Suppose the standards of the State—by the way, the scholarship program you propose, would it be proportionate to population in the various States?

Mr. DUBRIDGE. I think there would have to be some allocation; yes.

Mr. TELLER. Would the Nation benefit from such a program? If some of the States had standards which were so inadequate compared to the others, persons with relatively low I. Q.'s would receive prizes and scholarships paid for by Federal funds. In other States, people with higher I. Q.'s would be denied them because of their high standards.

Mr. DUBRIDGE. Yes, I think so. For this reason, once you give the student one of these prizes—let us say the prize is $1,000 a year—and this student is from State X, which, as you say, is one that possibly has low standards in its schools. This young fellow with $1,000 in his pocket can select any college in the Nation to go to school, but he must be admitted to that college.

Now, if a particular State finds that its scholarship winners cannot get into Harvard, Princeton, MIT, or Cal Tech, or what have you, then that State will say, "Our standards are low and advisedly not up to the standards of the rest of the country."

This would give an additional incentive. As soon as you encourage students to go to good schools around the country and those schools impose intellectual standards and prize students from particular States cannot meet those standards, this will be another stimulus to the States to lift their standards.

I believe the stimulus will be there, and I think it will grow.

Mr. TELLER. I just do not understand why you want to give administration of this scholarship program over to the States. You said, as I understand you, that that would be the democratic way. Why do you characterize that as the democratic way? Is the Federal Government less democratic than the States?

Mr. DUBRIDGE. It is more centralized, yes, and therefore it imposes nationwide standards policy procedures, where the States themselves ought to have something to say about it. You would get an exaggerated proportion of the youngsters from the wealthier States, which have the best school systems, and I want to improve all school systems throughout the country.

Mr. TELLER. The question is whether the States want to do so.

Mr. DUBRIDGE. Yes. You feel that some of the States do not. This is news to me. You may be right, and I have no data to contradict you, sir. I just would have had the other feeling, that in every State there are in the Government people who are anxious to elevate the standards of the schools and of its people.

Mr. TELLER. Thank you.

Mr. ELLIOTT. Let me suggest that Dr. DuBridge be given an opportunity to finish his statement, and then we will have questions, as many as we care to ask.

Mr. DUBRIDGE. I think, sir, I was essentially through with my statement when Mr. Gwinn asked his question. I had essentially nothing more to add.

My concluding point was simply that I hope a scholarship prize program would be established which would help to stimulate intellectual attainment throughout the country.

I have only one other suggestion about the Federal Government's activities. This refers to my own field of science and engineering. I think that the Federal Government has given inadequate attention and support to the development of scientific training at the advanced levels. Now I think the National Science Foundation has done a fine job with the funds which it has had at its disposal. I think the Office of Naval Research, the Research Division of the Atomic Energy Commission, the Office of Ordnance Research, the Public Health Service have all done excellent jobs, each in its own field. But I feel, for example, in the National Science Foundation, it has each year since its founding been given funds far less than the amount that it could have efficiently, effectively, and productively used for the support of research in basic science, for progress in engineering, and for the support of graduate teaching programs in science and engineering.

I hope very much, though this may not be within the function of this committee, that among the things which the Congress will do will be to give more adequate support to the research agencies within the Federal Government, the scientific research agencies, which are doing so much and can do so much to support graduate training and research in the universities in the fields of basic science.

I realize that is a special field in one special area, but it is a vitally important area in a country whose industrial and technological processes are so important in these days.

I think, sir, that is all I had to say in my general statement.

Mr. ELLIOTT. Dr. DuBridge, you speak of these scholarships as prizes. How many prizes would you recommend that we provide for the Nation?

Mr. DUBRIDGE. I think that is a difficult question. I am not prepared to give you a specific answer. I think I was asked by Dr. Killian a few weeks ago to review the programs of the Health, Education, and Welfare Department and the National Science Foundation and to study them. I have not studied all of the bills which are before Congress including your bill which is before this committee.

I have a feeling that the number of new scholarships offered each year ought to be something on the order of about 10,000 to 20,000. I would have no objection to 30,000 or 40,000. I would think that 2,000 or 3,000 would be much too small. So I think that the proper number is possibly between 10,000 to 40,000 each year, and I think it is a little hard to determine.

It is hard for me to determine precisely how many is the proper number in that area. I think any number from 10,000 to 20,000 would be a sufficient stimulus. I think even the merit scholarships of 400 to 500 have been sufficient stimulus. But I think one has to go beyond that and encourage participation throughout the country. I think we should start with 10,000 or 20,000 and if we start this for a few years we would know whether it is adequate or not.

Mr. ELLIOTT. Here is a thought that runs through my mind, Dr. DuBridge: There are 60 high schools in the congressional district I have the privilege of representing. If you divide 10,000 scholarships by 435 districts—and I know that is not the manner by which they

would be divided—if you did it on that basis there would be about 23 scholarships per congressional district. I have the very definite feeling if we are going to stimulate, such as you spoke of, the interest of the young folks, and the qualifications, and the schools, and all of that, that there certainly ought to be one scholarship for each high school, or something approaching that.

Mr. DuBridge. Do you know how many high schools there are in the country?

Mr. Elliott. No, sir. I do not.

Mr. DuBridge. I do not either.

But I think consideration of the sort that you mention would have to go into the study of the number.

On the other hand, I would like to point out that even if there are 10,000 scholarships divided around the country, this will seem like a small number, but the total number of people who get stimulated by the program is far beyond the number who win scholarships. If there are 10,000 awards to be given, my guess is that several hundred thousand, 200,000 or 300,000 students, might well compete or be stimulated to try or to at least look into the possibility. So though the number of winners will seem to be small, there will be many, many students who are competing and who are stimulated, and many of those who do not win these prizes will win some other prize. Or they will be stimulated to compete for other prizes, and there are lots of scholarships around the country in the various colleges, the States, and so on. So that it will go far beyond the mere matter of just the number of winners.

Mr. Elliott. Dr. DuBridge, the very efficient clerk of this committee tells us that there are 25,681 high schools in America.

Mr. DuBridge. Yes.

I think I would say then 10 to 20 thousand is about right. A lot of these 25,000 schools are very small ones with only a few students. If you try to offer one to every high school I think one would have a little difficulty in justifying that every high school should have one scholarship.

Mr. Elliott. Off the record.

(Discussion off the record.)

Mr. Elliott. Back on the record.

Do you feel, Dr. DuBridge, that a program of loans might fit into this picture anywhere?

Mr. DuBridge. Yes; very decidedly. There are quite a number of people who feel, and I share the feeling, that one should not go too far in making gifts to students, but one should give students a feeling of responsibility that they are making an investment in their own future when they go on to a college or a university.

So I would like to advocate in connection with a scholarship program, though one does make prizes for achievement as gifts, that one also encourage students to borrow the money which they need to finance their own higher education because they and their families will profit from this experience in later years and they can afford to return the investment that has been made.

So I would think that a loan program would be a very desirable program to accompany a scholarship program. We are trying to devise a more effective loan program in our own institution. We

have a substantial scholarship program, but we feel too few students borrow the money that they need and somehow the idea of borrowing the money has become a little unpopular among students.

Mr. ELLIOTT. Except for automobiles, Doctor.

Mr. DUBRIDGE. That is just what I was coming to. People are quite used to a deferred-payment plan. They are quite used to travel now and pay later.

I am going to propose that we educate now and pay later, and that a deferred-payment plan for students and their families be devised as a way for paying over a longer period for the cost, say, in a private institution over a short period.

We figured, for example, that a family of a student who wanted to put his boy through our institution, and we are thinking of raising our tuition substantially, so it will be a fairly high tuition, that over a 4-year period his tuition will cost him under our new proposal—off the record.

(Discussion off the record.)

Mr. DUBRIDGE. On the record. Our tuition will be higher.

In order to help boys finance this, we are proposing a 10-year payment plan and it turns out that about $40 a month for 10 years will finance the entire cost of tuition for 4 years.

Now, we need money, of course, to finance that. So a loan fund would be a very useful device to help us finance this higher tuition through a deferred-payment plan. I think some kind of imaginative new type of loan program needs to be developed. Whether the Federal Government needs to get into this, I do not know. I think possibly it does need to provide a pool of funds for it. It would not cost any money in the long run because it would all be paid back. To provide a pool of funds would be very useful. On the other hand, I find quite a number of companies and banks are intrigued with this idea and seem to be willing to help the private institution to provide the funds for loaning on a deferred-payment plan of some sort and if the Federal Government provided a pool of funds this might stimulate companies and banks to provide additional funds.

Mr. ELLIOTT. The gentlelady from Oregon, Mrs. Green.

Mrs. GREEN. Dr. DuBridge, you mentioned that 30 to 50 percent of the top 10 percent do not go to college. Do you know what percentage of the total high-school graduates do go to college?

Mr. DUBRIDGE. Of the total high-school graduates it is about 30 percent I believe.

Mr. FRELINGHUYSEN. If the gentlelady will yield, I think the Commissioner of Education yesterday said 32 percent, because I recall his testimony.

Mrs. GREEN. Thirty-two percent do go to college?

Mr. DUBRIDGE. I think that is the national average. I think in some States it goes much higher. I believe in the State of California last year well over 50 percent of the high-school graduates last June entered some college or university last fall. It varies greatly. Thank you very much. Thirty-two percent is the average.

Mrs. GREEN. California Tech accepts 1 out of 10. Did I hear at the Yale conference that you admit 1 out of 10 applicants?

Mr. DUBRIDGE. We admit slightly more than that but of those that show up and actually register only about 1 out of 7 or 8 actually

register of those who apply. Of course, we do not encourage an application unless the man seems to have the ability.

Mrs. GREEN. You have done a screening process even before that.

Mr. DUBRIDGE. Before the application has been submitted, a man must pay an application fee, so we discourage many from making an application at all if he is clearly unqualified or clearly so far down that he would not be admitted. I should possibly add, however, that the California Institute of Technology and a few other engineering schools are possibly in a somewhat unusual position in this respect: There are private engineering colleges that are quite good that are not full, that could admit more students if they applied. I believe that there are spaces in our private engineering colleges for more engineering students at the present time. So it is not facilities or space in our private schools that is preventing more engineers from being trained.

Mrs. GREEN. You mentioned funds being channeled through the States for a scholarship program.

Mr. DUBRIDGE. Yes.

Mrs. GREEN. I believe that the representative from the American Council on Education recommended that a State quota be set up. Would you favor a quota by States, or would you favor finding the brains, wherever they are, and letting them be awarded the scholarships?

Mr. DUBRIDGE. For the undergraduate scholarships I would prefer a State allocation of some kind. In the National Science Foundation there are science fellowships at the graduate level for graduate study. This is a national contest. But there is even there somewhat of an allocation among the States. After the best candidates of the country have received awards from the National Science Foundation, they then look and see how these best candidates are distributed among the States. If certain individual States seem to be low in the number they will bring a few more in from that State. There is a certain State allocation even at the graduate level. Naturally, we want to find the best brains wherever they are throughout the country.

In order to accomplish the purpose I was suggesting to stimulate the schools throughout the country, I think it would be better for each State to have the feeling that it had a chance comparable with the chance of the other States that its best students would receive these awards.

And I do not believe there is any favoritism among the States. I do not think God gave any particular State more brains than any other State. He may have given them more money but not more brains. There are just as many smart people in State A as State B. And the fraction of population having brains is probably about the same in the States. But the education systems vary for a variety of reasons. So I think this would justify a State allocation, so the best brains in each State would have a chance and not be handicapped because their particular State happens to have low educational standards and have not been able to afford better schools, let us say.

Mrs. GREEN. You suggested a number somewhere between ten and forty thousand. Would you have all those undergraduate scholarships?

Mr. DuBridge. I was thinking of undergraduate scholarships solely. I was talking solely about that rather than graduate scholarships.

Mrs. Green. What do you recommend on the graduate level? Do you think the Federal Government has a responsibility here, and, if so, to what extent?

Mr. DuBridge. The Federal Government is already giving fellowships in science through the National Science Foundation. They are giving fellowships in medical science through the Public Health Service. I believe the Federal Government is not giving scholarships in nonscientific fields as far as I know. To what extent you should go into that problem I am a little undecided. I think you get into rather difficult areas there and also areas where the needs are possibly not so critical so far as the Federal Government is concerned. I do think, however, that the proposals of the National Science Foundation, and I think also the Public Health Service for an increasing number of graduate fellowships in science and medicine are justified and, indeed, very much needed. I hope very much that the additional graduate fellowship program now being proposed and talked about will pass the Congress.

Mrs. Green. You would favor the expansion of this program?

Mr. DuBridge. Yes.

Mrs. Green. You think it is inadequate now?

Mr. DuBridge. Yes.

Mrs. Green. You made a very definite point that the scholarships should be awarded on the basis of merit and achievement. Do you think there should be any financial test? Do you think there should be a means test?

Mr. DuBridge. For the kind of scholarships we are talking about I prefer to have a means test attached.

Now, this may sound strange and for a long while I was very uncertain about this particular point, but the more I thought about it the more I have come to the conclusion that for the Federal scholarship program, if one of its primary functions is to be to stimulate better work in all of our high schools, then it is quite essential that these prizes be given solely for intellectual achievement without regard to financial need. The rich boy and poor boy should have equal chance to get this prize.

I have seen many bitterly disappointed young men who were extremely bright who won a scholarship and then were told they would not get any money because their fathers earn more than $10,000 a year and they were not eligible. This gives the boy a strange sense of frustration because he would like to feel he earned something on his own and the stimulation would be greater if it was his achievement and not his dad's that enters into the picture as to whether he gets the prize or not. I would like to see this group of scholarship prizes that the Government offers awarded straight on the basis of intellectual merit. I think the National Merit Scholarship Corp. is probably doing the right thing in its program of demanding a means test, and I think in the colleges we are doing the right thing when we use our own funds to help students that we deem have not only intellectual achievement but also give the money where it is most needed, but if the Federal Government is going into this business, it is going in it, I hope, to raise intellectual standards and there the means test has no place.

Mrs. GREEN. May I say, Dr. DuBridge, I am delighted to hear you say this. This has been my feeling and you have been one of the few people who have appeared before the committee who has not favored a means test.

Mr. DUBRIDGE. Is that so?

Mrs. GREEN. It seems difficult to set up the amount of money that the family must have.

Mr. DUBRIDGE. It is very difficult.

Mrs. GREEN. And how many youngsters they have in highschool and college certainly has a bearing, and also if you put up a requirement that they have a mortgage on their home I do not know that you are awarding the family that paid off the mortgage or awarding the family that has taken on too big a one. There are so many factors that go into that.

Mr. DUBRIDGE. I agree with you and the Federal Government to require a family to list bank accounts, salaries and income, and its expenditures and so on, I think gets into a very gravely difficult problem.

Mrs. GREEN. When you are talking about Federal control of the curriculum for personnel this could well be——

Mr. DUBRIDGE. And Federal control of how you spend your money.

Mrs. GREEN. I have another question. That is as to the problems that the colleges and universities are facing in meeting the operating costs and building construction costs. Do you feel that if the Federal Government goes into a scholarship program that there should also be a matching sum or a sum given to the university or college itself?

Mr. DUBRIDGE. As a college administrator, naturally I would have to say yes to that question because it is perfectly true that in private institutions the charges for tuition are very much less than the actual cost of education, but when I look as a citizen at this particular proposal that we have been talking about of awarding prizes to students then I am inclined to think that that should not be accompanied by grants to the institution. Needless to say I have no objection to that grant but I think maybe the point of this program might be more obvious if it were simply said that this was a prize to the student. Now, as a prize to the student it will help the colleges. It will help us in two ways.

Incidentally, with only 10,000 of these being awarded, this is not going to flood the colleges. I mean we are already admitting six or seven hundred thousand college students a year. If there are 10,000 more it is not going to change the order of magnitude of the problem. We hope many of these 10,000 would have gone anyway. Therefore, it is not true to say that we are going to flood the colleges with more students than they can take care of by such a program. The numbers are not great numbers.

It will help us in two ways. First, it will help us in the private institutions to charge a higher tuition and practically all the higher institutions are going to be forced to charge higher tuitions. And the thing that impedes us to charge higher tuition is we hate to exclude able but impecunious young men and women. If the very able ones are unable to pay their way by winning such a prize then it would be such a hardship on them if the tuition is increased. Sec-

ondly, if in our private institutions a modern number of scholarship winners appear with their $1,000 available to pay their tuition, this will relieve our scholarship funds and the scholarship funds we have for allocation can be allocated to others. It will make our funds go farther.

I would like to suggest that the program be set up as a prize to the student for intellectual achievement entirely, that the student be allowed to go in any field he desires, to any institution in the country that he desires, that he simply be given this prize money each year and that that is his to use as he wants and that this be set up, frankly, as a prize program to encourage higher intellectual achievement on the part of the students in our schools.

Mrs. GREEN. May I say, Mr. Chairman, that I have thoroughly enjoyed hearing Dr. DuBridge again today before the committee. I think he has been an outstanding person to come help us in our problems. The people who attended the Yale Conference the other day I am sure recognized him as one of the outstanding speakers at that conference. He spoke at the luncheon meeting.

Mr. DUBRIDGE. Thank you very much, Mrs. Green, I appreciate your words.

Mr. ELLIOTT. The gentleman from New York, Mr. Gwinn.

Mr. GWINN. Dr. DuBridge, the thing that troubles me about you is you have your own highly specialized, very dear pet, where you want the Federal Government to enter in.

Mr. DUBRIDGE. May I put it differently? I am only speaking in the field where I have some knowledge.

Mr. GWINN. Now, I was thinking while you were testifying that we could bring here witnesses to make out just as good a case, theoretically of the Federal Government making our electric power and energy and managing that because we have done some very bad jobs in the past, and the farmer will make a case for the basic principle of the Federal Government supporting that basic industry for the very survival of us. You can go all up and down with a list with each expert in his field with the same emotional drive that you have for your field, and the first thing you know we would all be looking to this godlike source down here, which is nothing in the world but a very human political organization. You idealize what we are going to do. I think it is a very poor case you make out for money with no control and no influence and no standards. I think it is irresponsible for the Federal Government to take by force from the people their tax money and then hand it back to them in the form of a check with no accounting to Congress as to what performance we are getting or likely to get and what our objective is to start with. If we do that then we have many examples of the Federal Government interfering with education, plenty of them, certainly by negative suggestions of various sorts. Take vocational education.

Mr. UDALL. Will my colleague yield?

Mr. GWINN. I will just finish this point. I, myself, think that education entered in about the time of the progressive education, and may be more responsible for these soft courses that bring about the results that you so well describe, bring about a lack of intellectual effort. The Federal Government paid the teachers more for giving the soft courses than the local taxpayers could pay or did pay for the hard courses, the tough courses. Is that not so?

Mr. DuBRIDGE. You are thinking of State programs and the land-grant colleges?

Mr. GWINN. I am thinking of the total influence.

Mr. DuBRIDGE. Yes.

Mr. GWINN. Of the Federal Government on our educational system. There are those areas where we were paying the highest salaries and having the best equipment which were the sources where the soft courses were, were they not?

Mr. DuBRIDGE. I do not believe so. I am not fully competent in that field, but if you are speaking of the land grants to the State colleges——

Mr. GWINN. Now I am speaking about the high-school courses in vocational engineering.

Mr. DuBRIDGE. I see.

Mr. GWINN. Boatbuilding, carpentering, and that sort of thing.

Mrs. GREEN. Will the gentleman yield?

Mr. GWINN. Yes; I yield.

Mrs. GREEN. I do not know about other States, but I think in my own State that the athletic coaches, who are paid entirely by the local school board, are the highest salaried people in the educational system.

Mr. GWINN. That would be just the kind of activity that the Federal Government would be likely to support, because that would be politically popular.

Mr. UDALL. Would my colleague yield to me?

Mr. GWINN. I yield.

Mr. UDALL. I do not want the witness to feel that he is expressing the sentiment of the whole committee. In fact, it seems to me, and the witness certainly proposed that we set up standards and guidelines if we had a program. The gentleman from New York is essentially saying if we do not do that and simply give them money we are being irresponsible. On the other hand, if we propose to set up standards, the gentleman is talking about controls. So, we lose the argument with him either way. On one hand we are irresponsible and on the other hand we want to control the local people.

Mr. GWINN. It is not important whether we use the argument either way, if we have no sure argument. The witness has traveled around the world and his very first statement of pride was—

with all of our shortcomings, we have the best educational system and are getting the best results out of it, including the Russians.

Is that not right?

Mr. DuBRIDGE. That is correct.

Mr. GWINN. And the Federal Government had not given us these scholarships to that point. Would you make the same argument for other areas of Federal Government going into it because it could do it better than we could do it in the 48 States.

Mr. DuBRIDGE. I appreciated very much, Mr. Gwinn, your point. You expressed my own misgivings in regard to too great a Federal participation in any area. I do feel, however, that in this particular area we are facing a special situation and a difficult situation today. It is true that I think we do have the best educational system in the world, but I do not think it is good enough. I think we could make it better, and I think it is up to us to make it better. I think we are facing a challenge from another power to our intellectual competence

and to our progress and to the soundness of our economic, political, technological, and industrial system that we never faced in history before.

We, therefore, have special urgency of improving our intellectual standards all the way up and down the line. I agree with what you implied. This is really the problem of local communities and the local States. But, like national defense is a problem for the Federal Government, so the national strength in the face of this challenge from abroad is a matter of interest to the Federal Government. I think it is of very great importance that the Federal Government exhibit its interest in this field, exhibit its interest in higher intellectual standards, exhibit its interest in having the brains of the people more effectively developed and more effectively utilized.

Now, the Federal Government might exhibit its interest by speeches from the Congressmen and from the White House and from Federal offices, but I think a little cash helps, too. This, after all, is the capitalistic system, and we exhibit our incentives and interest by a little exhibition of cash now and then. I do not think it will in any way hurt for the Federal Government to say, "We are so interested in this problem that we are willing to put up a little money toward it."

The amount of money is a small amount when you come to the expenditure for education in the country or the total amount of expenditure by the Federal Government. It is only a little signal, a little spark, a little stimulus that I am talking about. And I do not think it is irresponsible if these funds are given for achievement. These are prizes given for achievement. These are just not handouts. These are given for special intellectual achievements, and only given to those who have shown their capacity.

Mr. GWINN. Doctor, it is not the money involved, but it is the influence of the Government that worries me.

Mr. DUBRIDGE. Yes.

Mr. GWINN. I think the Government influence is likely to be bad, because about all it can do is to give money. It overemphasizes by publicity, by the very overpowering influence of Government itself, the speeches of the President and the Vice President and the Commissioners, with sputnik adding to our emotional tendency, anyway, which is worse in Washington than any place else in the world, I think.

Mr. LANDRUM. Would my friend from New York yield to me?

Mr. GWINN. Let me finish this, and then I am going to yield the floor. For instance, the Government could not possibly round out its total influence on our educational system by putting a needed modicum of religious instruction alongside of this mathematical and scientific instruction. So, when we come out we may be one-sided mathematicians and scientists, may we not? Even as great as our need is, we may not produce the total picture that we need to produce in order to survive.

Mr. THOMPSON. Will the gentleman yield to me?

Mr. DUBRIDGE. I agree. In fact, I said we are talking about only one phase of our problem, the educational phase. We are not talking about the church, not talking about homes, not talking about like institutions.

Mr. GWINN. The Federal Government is totally neglecting that in the money talk, is it not? In this picture we are talking about right

now is a one-sided, highly specialized field. Where are we going to get the equal amount of influence and stimulation to round out even the scientists that you are talking about?

Mr. DuBridge. If I may say so, sir, the colleges and universities of this country are doing their best to produce—I do not like the phrase, but it is a symbolic one—a well-rounded individual. Our education in the best universities of this country is not highly specialized. At the California Institute of Technology we try hard to insure that the scientist and engineer learns not only his science and engineering but learns other subjects, too. We force him to spend a substantial amount of his time in nonscientific, nonengineering subjects.

Mr. Gwinn. Yes. You do that in your institutions. But you are a private institution.

Mr. DuBridge. Yes, sir.

Mr. Gwinn. The Government is not able to do that.

I yield to the gentleman from Georgia, and I am giving up the floor.

Mr. Landrum. If you will yield the floor, I will defer my questioning.

Mr. Thompson. Will the gentleman yield?

Mr. Gwinn. I will yield. I am sorry to have taken so long from the other members.

Mr. Elliott. The gentleman from South Dakota, Mr. McGovern.

Mr. McGovern. Mr. Chairman, let me say, first of all, in all due respect to our distinguished colleague from New York, I did not understand the witness at any time today to imply that these scholarships ought to be limited to the scientific and mathematics field. As a matter of fact, I want to commend Dr. DuBridge that, in spite of the fact that he represents a great school of science and engineering, he specifically stressed in his statement that any national scholarship program should not be limited to those fields, and that the students should be perfectly free to major in any particular area that he wishes. Am I correct on that?

Mr. DuBridge. That is correct. That is what I advocated. I did suggest that in the tests demanding intellectual subjects, such as English, grammar, foreign language, and mathematics be stressed.

Mr. McGovern. Yes.

Mr. DuBridge. Rather than basket weaving and automobile driving.

Mr. McGovern. Presumably the student would have to demonstrate competency in all the basic fields of knowledge, grammar, history, literature, science and mathematics, as a well-rounded education background.

Mr. DuBridge. Yes. That is what I was suggesting.

Mr. McGovern. There was one specific question that I wanted to direct to you, Dr. DuBridge. I had an inquiry from some of the administrators of the schools in my own State recently and they were disturbed about the fact that in our State, which is rather sparsely populated, and is becoming more sparsely populated, in some areas as the farm units become larger and the ranching units become larger that they are unable to maintain a tax base that is good enough to support good faculties, particulary in the field of mathematics and science. They were suggesting that possibly some of the larger high schools in

the State could open up a night school program, possibly 1 or 2 nights a week, or as an alternative, a plan of a summer school program that would operate in some of the larger schools and the students from the smaller schools would be invited to come in 1 or 2 nights a week or perhaps a month in the summer to take courses, special work in mathematics and science under people who presumably are better equipped in the larger schools and that it would require some assistance either from the State of Federal Government to carry out a program like that.

As an educator, do you think that that kind of a program would be worthwhile and practical?

Mr. DuBridge. Yes. I do, very much.

When I suggested certain things that the Federal Government might do to help in the educational process, I did not mean those were the only areas that needed attention or the only areas that needed something to be done. I think the States and local communities have a vast problem to improve their schools, and I think it is quite true, as you said, in many communities it is the tax base that offers the problem. And do you have an income tax in your State, for example?

Mr. McGovern. No, we do not.

Mr. DuBridge. Maybe the State would have to impose an income tax to assist in the educational process where the real estate and property taxes are not adequate.

In California, for example, the State collects an income tax and helps support the local schools through State income tax funds.

But there are many things to do in stimulating and training teachers of the sort you suggest. This is another thing the Science Foundation is doing in the field of science to help stimulate and train teachers in mathematics and science throughout the country by summer school program and by evening lectures and evening institutes of various sorts by offering scholarships, so that these teachers can go back to school and get additional training in their subject matter field and a variety of other ways.

These, I think, are very important, and very good and can mostly be financed at the State and local levels and managed at the State and local levels, but although the Science Foundation has a national program and the science teaching field I think is also a good one, there are even certain high schools around the country that are moderately well equipped with faculty and equipment in certain fields that are offering to give education and summer programs to high school students from other areas or other high schools that are not as well equipped and are offering attractions to high school students to come and study advanced courses in mathematics and science and language during the summer period if those courses are not available at their own schools.

There is a great surge of activity, I think, in the educational field, and I think this is all to the good. There are many, many things that are being tried and achieved.

Mr. McGovern. Thank you very much, Dr. DuBridge.

Mr. Elliott. The gentleman from New Jersey, Mr. Frelinghuysen.

Mr. Frelinghuysen. Mr. Chairman, I listened to Dr. DuBridge with great interest, also, and I just want to follow up what he was commenting on with respect to the role of the Federal Government.

I think perhaps it is almost too easy to overstress the scholarship proposal as the most appropriate or the only reasonable way in which the Federal Government can help. Of course, in the administration's program, which is one of the major bills before us, a relatively small amount of dollars out of a total of roughly $1 billion to be spent over the next 4 years would be allocated for scholarships.

I think it is something like $75 million over a 4-year period, perhaps. I think it is that much.

There is something like $600 million out of the $1 billion that would be provided for, or the intention would be, to improve teaching, and I wonder whether you would care to comment on the 2 items you mentioned at the outset, buildings and equipment and teaching and what the Federal role might be. Do you think it would be advisable for Federal money to be made available to supplement teachers' salaries, to provide money to support additions to the faculty, to provide equipment, scientific or otherwise to our institutions of learning? Is this a reasonable responsibility of the Federal Government in a way in which we can help with the specific problem of improving the quality of the teaching, which, of course, is a key question in this whole situation?

Mr. DuBridge. Yes. Well, the answer to your question, of course, is political rather than the technical education. There is no question but what there is a tremendous need for additional salaries for teachers.

One of the reasons we are attracting fewer able people into the teaching professions at the elementary and high school level is the matter of teachers' salaries and that there is a tremendous need throughout the country for increasing the attractiveness to the teaching profession to our young people, both intellectually and financially.

Now, the question is as to whether or to what extent the Federal Government should enter this picture is a question which has many difficult political overtones which I am not competent to judge. My first inclination would be to suggest that maybe as a signal again that the Federal Government is concerned with this problem that it hopes the State and local communities will take a greater interest in this problem, it might offer some kind of a prize program for rewarding good teaching by additional salary awards through the local communities, and thereby increase somewhat the level of teachers' salaries, that this might again be a good thing.

I think for the Federal Government to enter into a permanent subsidy of local schools, that goes against my political feeling that this is desirable.

So I would like to see the Federal Government confine its attention to doing emergency things and to offering stimuli to the local school systems to do a better job and to offer them temporary financial relief in building their teaching faculties, their teaching staffs, and rewarding good teachers as well as good students.

Mr. Frelinghuysen. The program, of course, advocated by the President, is described as an emergency program.

Mr. DuBridge. Yes.

Mr. Frelinghuysen. Of course, if the Federal money is serving a useful purpose——

Mr. DuBridge. Yes. It could be continued.

Mr. FRELINGHUYSEN. If there are needs at the end of the 4-year period you cannot be sure it would not continue.

Mr. DUBRIDGE. Yes.

Mr. FRELINGHUYSEN. Once you start something.

Mr. DUBRIDGE. It is very difficult to stop.

Mr. FRELINGHUYSEN. You may find good reasons to continue it.

This is more than a token program. I assume you are talking about $150 million a year to be made to the State for a variety of purposes, including buying of equipment or supplementing teachers' salaries, or other ways. Primarily, it is aimed, at the present at least, at science and mathematics.

Mr. DUBRIDGE. Yes.

Mr. FRELINGHUYSEN. It is aimed at strengthening those areas of our education system where the interest seems most apparent and the national interest seems most vital.

Mr. DUBRIDGE. Yes. That is, in a sense, a token program. After all, we are spending in the country many billions of dollars a year on education.

Six billion dollars, is it, or something like that?

Mr. UDALL. Sixteen billion dollars.

Mr. DUBRIDGE. Sixteen billion dollars.

Mr. UDALL. Yes.

Mr. DUBRIDGE. And $100 million a year contribution is, in a sense, token only and does not dominate or greatly change the picture.

For that reason I favor the President's program because it is set up to meet a current special situation and, though I agree there are dangers that it might continue, but that is not the present purpose that it should continue and it is a token program, a program whose purpose it is to stimulate State and local communities rather than to take over and manage and pay the bill from Washington.

Mr. FRELINGHUYSEN. Thank you very much, Dr. DuBridge.

Mr. ELLIOTT. The gentleman from Georgia, Mr. Landrum.

Mr. LANDRUM. Thank you, Mr. Chairman.

Doctor, I thoroughly enjoyed this discussion. I believe it to be the most refreshing one I have heard about this problem of education. I would say that you had described with rare diplomatic eloquence a softness which I believe we all know exists in our high schools and which, personally, I have been aware of for more than 20 years.

I am inclined to be somewhat more blunt about it than you have been. I wonder if you could say it is not true that the most critical problem in the field of education today is the softness in our high schools, public high schools generally, the softness of the curricula.

Mr. DUBRIDGE. Yes; I believe I would agree with that.

Mr. LANDRUM. And until we correct that we are not going to move any great degree toward the solving of this shortage of the intellectual need.

Mr. DUBRIDGE. Yes, sir.

Mr. LANDRUM. As I understand your recommendations here you do not favor the Federal Government entering into any subsidy of our educational programs throughout the States. Your recommendations are directed at the principal critical problem of providing a stimulus in the local schools——

Mr. DUBRIDGE. Yes, sir.

Mr. LANDRUM. To get these schools to again require the hard courses as the fundamentals of our educational program.

Mr. DUBRIDGE. Yes, sir.

Mr. LANDRUM. I have been one to oppose the entrance of the Federal Government into our education but faced with such a problem as we all know and as you so well describe here today, I would be inclined to say that thou almost persuaded me and I have been just about as obstinate about the thing as my dear friend from New York is and probably all of us should be.

Mr. DUBRIDGE. Thank you, sir.

May I say also I was hard to persuade on this subject, too. It has been a long time before I came to the conclusion that I expressed today.

Mr. LANDRUM. Let me ask you one question: I was interested in your response to Mrs. Green's question about the requirement for financial inability before you rendered the scholarships. Would you attach any obligation to the prize—not the loan, now, we are staying outside of that—would you attach any obligation to the recipient of that prize after his graduation from college or university?

Mr. DUBRIDGE. No, I would not. I would only require that he receive the prize each year, only provided he maintain standing in the college or university that he was attending and I would stop the prize if he were kicked out of college or failed to make the grades.

Mr. LANDRUM. He would be completely free so far as his obligation to the Government for that prize?

Mr. DUBRIDGE. Yes. I do not believe in indentured servitude. I think to give a man a prize and say this requires you to make some service at a future date would be unfortunate.

Mr. LANDRUM. I would like to ask one other question if I would not be too indulgent here.

Is it your observation that the Federal Government has been responsible somewhat for the development of this soft curriculum in our high schools?

Mr. DUBRIDGE. I do not believe that any specific act of the Federal Government could be held responsible for this. If one wants to say that the Federal Government could have prevented this happening by taking more of an interest in our educational welfare, our educational quality before, then I suppose one could not deny that if the Federal Government had said 25 years ago that the intellectual attainments of our people are of great interest to us for purposes of national welfare, it is conceivable that this softening process could have been slowed up or retarded. In other words, looking back you can say this, but this does not mean I think it was appropriate for the Federal Government necessarily to have done this.

Mr. LANDRUM. Could the support of the Federal Government of higher salaries in the field of vocational education, to which Mr. Gwinn has referred, have had any influence on the exclusion of the hard courses to the favoring of this broadening of our vocational field?

Mr. DUBRIDGE. Frankly, I never heard before the charge that this has been a deteriorating influence on our schools, and I am really not competent to answer whether it has or has not been.

I felt that in the field of higher education the land grants by the Federal Government in the field of agriculture and the mechanic arts, as it was called, has been stimulating good and has elevated the work

that we have done in higher education, especially in the agricultural areas.

As to the special question of vocational education, however, I must simply say I do not know what the influence of the Federal Government has been in that field.

Mr. GWINN. May I make a comment there, Mr. Chairman?

Mr. ELLIOTT. Yes.

Mr. GWINN. I think it has a very great bearing on it. When we took everybody into our high schools, which we did not do before the First World War, we enormously increased our public school attendance in high school. The idea was that there would be high schools for college, that is, the student entering into high school A would get the regular basic subject matter and be prepared for college, as they are today, in the nonpublic schools. Then there would be the regular industrial arts high schools that we have in the city of Yonkers, the famous high schools in industrial art, which means that we train boys and girls in industry. They have no intention of going to the colleges, the accredited colleges. Then there were other subject matters and we set up other high schools to take care of the group of boys and girls that either felt they did not want to go to college or that they were not equipped to go.

But we messed up this college high school with a lot of this stuff, so as to ease it up and make it more popular and give the children a better selection. We got, as I understand it, our softening courses or the courses that were different and much easier than the basic subject matter, scattered all through our system.

Mr. DUBRIDGE. In other words, what you are complaining about is a confusion of objectives.

Mr. GWINN. That is right.

Mr. DUBRIDGE. I think this may have happened. But I think this may not have happened if we could select the proper students to go to the vocational schools and learn to be our carpenters, our bricklayers, our mechanics, our electricians, and our electronic technicians. We need those desperately and badly. It would be a good type of training for them to have.

Mr. GWINN. That is right.

Mr. DUBRIDGE. We also ought to select out this opportunity to do the academic and intellectual work.

Mr. GWINN. I sympathize with the man from Georgia. If we are going to correct it, we have to correct it down there where the trouble is.

Mr. THOMPSON. Would the gentleman yield to me?

Mr. GWINN. I yield.

Mr. THOMPSON. Dr. DuBridge, unfortunately I did not hear your opening remarks. I am sorry. But we were working on another bill in the next room. But I have been very interested in the discussion. Do you not feel that in selecting out those best fitted for various fields of endeavor, whether they be for science, for literature or bricklaying, that this business of testing and guidance counseling would be valuable?

Mr. DUBRIDGE. Yes, that is one. One of the reasons for a scholarship program is to stimulate a search for the good students, and the search must be carried on partly through testing, partly through coun-

seling, partly through encouraging and stimulating a student to take the proper courses, and partly through providing a respectability for getting an A. There are many schools in which it just is not respectable to win a top grade; that the respectable grade is a C, but if there is a stimulus there, maybe we can lift the respectability of intellectual achievement.

Mr. THOMPSON. Does Cal Tech use the college board entrance examination, Doctor?

Mr. DUBRIDGE. Yes, we do.

Mr. THOMPSON. They are from the Educational Testing Service at Princeton.

Mr. DUBRIDGE. That is correct.

Mr. THOMPSON. Which is in my district and I am very proud of it.

Mr. DUBRIDGE. We used to give our own examination and then for several years we gave both and compared the results of the two and we found that the college board examinations were somewhat better predictors of success than were our own examinations which we ourselves had prepared.

Mr. THOMPSON. I have one more question. I hope I am not imposing too many, Doctor.

I have been suggesting for some time, and this legislation is not before this committee, but it is pertinent, I think, the creation of a distinguished civilian award by the Government of the United States for outstanding achievement each year in the arts and sciences.

Do you think a think like that would provide a stimulus to those who are doing research and writing and taking part in the various humanities and sciences?

Mr. DUBRIDGE. There is such an award in the field of atomic energy, the Ferma award for high achievement in the area of atomic energy.

Yes; I think such awards are very valuable and could well be awards in other fields.

Mr. THOMPSON. Thank you, Doctor.

Mr. ELLIOTT. The gentleman from Pennsylvania.

Mr. HOLLAND. I want to commend you, too, on the presentation of your case. I might add way back in 1956 I sent a questionnaire out to every dean of engineering school in the United States. Out of the 148 that I sent out 135 people answered, and they answered exactly the way you are talking today. These were the problems they had that they had gone a little further. They state that the big problem is that they are competing with industry for science teachers, engineer teachers, and mathematicians and until we raise tehir income up to what they get in private industry we will never solve this problem.

I am in an industrial area, the Third Congressional District of Pennsylvania. The Third Congressional District has 68,000 employees in the steel mills alone, plus the large number in the Westinghouse plant and other plants.

We cannot keep mathematics teachers in our high schools. To prove this case, I hand out or give out my appointments to the service schools strictly through a competitive examination. They are held by the superintendent of the Pittsburgh schools, the superintendent of the county schools, the superintendent of the parochial schools, and the superintendent of all the independent school districts.

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The first time we had the examination 1 out of every 4 passed and 3 out of every 4 failed. That was just to make a standard mark. Some went down as low as 30.

Mr. GWINN. In Algebra?

Mr. HOLLAND. In algebra, chemistry, and in English.

Beginning this term I appeared before all the high schools in my district and met with the principals and we tried to spark it up a little bit. In the examination we held this year we had a larger number. One out of every three only failed. A lot of the boys took algebra and chemistry and stayed after school to do a little cramming and I am proud to say out of this group there are 31 of them trying to take some of the foundation examinations this year.

This is what I think is most important and I find it is from my experience with over 23 years in education.

For your information, I was on the education committee in the house of representatives of the Commonwealth of Pennsylvania and for 13 years in the senate of Pennsylvania and I am the author of the teachers' tenure act of Pennsylvania. And in the Sabbattic League.

I think the problem is that we have never given them incentive. When they found out how much it was going to cost them to become scientists, they immediately dropped out because they knew they did not have the money and they took some other subject.

To answer Mr. Gwinn, I guess you and I are around the same age.

Mr. GWINN. Thank you.

Mr. HOLLAND. Because when I went to school we had an academic high school, a commercial high school, and we had a teachers' high school, a normal high school. They were the only three we had in the city of Pittsburgh. There were three separate schools. Those who went to the academic high school received a lot of chemistry and a lot of algebra and a lot of mathematics that they do not get today.

I think one of the big problems is how we are going to reach into in high-school courses; and also how are we going to influence the men who are graduating from engineering school to take up teaching in the preparatory school and teach the subjects. And of course I think one of the big problems is how are we going to get people to go into graduate work.

In talking to the group of deans of engineering that I had in my office 3 months ago from the largest schools of the East, they told me that most of the boys had a standing joke in the fourth year of engineering school. When you ask them are they going into graduate work they say: "I am going where the girl has a good income and a good job. If she marries me, I am going into graduate work. If not, I am going to work."

And I think that is very true. I think that is a problem. I have a bill, but it is not in this committee. I do not believe we should work with the States at all, the departments of public instruction——

Mr. DUBRIDGE. At the graduate level?

Mr. HOLLAND. What is that?

Mr. DUBRIDGE. Do you mean at the graduate level?

Mr. HOLLAND. Yes.

Mr. DUBRIDGE. I agree.

Mr. HOLLAND. I think we should work exactly with the good students. The examination should be continued by the National Sci-

ence Foundation. It should be apportioned by congressional districts because then the Congress will become interested in notifying everyone that there are those types of examination.

I also think that the boy, like you say, should be permitted to choose any school he wants to. The Federal Government, through the National Science Foundation, will work collectively with that college or the university; and I also believe we should subsidize the faculties of all the engineering schools and also encourage the boys who graduate if they go to teach for a certain period of time—and you may not agree with this—if they go to teach for 3 or 4 years that the Government will subsidize them their difference in pay they would receive as an engineer working in private enterprise above what they receive as a teacher; and that, at the end of 4 years, they be given an opportunity without costing them to enter graduate schools and be paid their expenses while they are there.

I am alarmed. In these last few weeks I have received a list of all those who work on atomic energy or the atomic energy bomb.

I do not know if you have it, Mr. Gwinn. If not, I will send it over to you. They were all educated abroad. In the satellite we put up, there were very few people educated in America that put it up. The team came out of the schools of Germany and Hungary.

Mr. DuBridge. May I enter a slight objection to the last statement?

Mr. Holland. Yes.

Mr. DuBridge. The putting up of the Explorer was a joint effort between the Army Ballistic Missile Agency in Huntsville, Ala., and the Jet Propulsion Laboratory of the California Institute of Technology. Our people have responsibility for all the upper end of the missile. The ABMA had responsibility for the lower end.

It is true that at Huntsville the work is in the charge of Dr. Von Braun and many of his colleagues from Germany. At the California Institute of Technology, the work is in the charge mostly of men who received their bachelors, masters, and doctors degrees at Cal Tech.

Mr. Holland. I am glad to hear you say that.

Mr. Thompson. Will the gentleman yield to me?

Mr. Holland. Yes.

Mr. Thompson. I might say that during the war I had command of the first unit of ships to use spin-stabilized 5-inch rockets. They were developed at Cal Tech by Cal Tech. In the course that I took there from your people in the operation of these things they were all Americans. That was an absolutely revolutionary weapon development, and I do not know whether anyone ever reported to you, but they worked just beautifully.

Mr. DuBridge. We have a record of that. Thank you.

Mr. Holland. May I ask you a question?

As to all the teachers you have educated in the United States, are these people graduates of American schools that worked in Cal Tech?

Mr. DuBridge. If you take the top—naturally we welcome people from every country on our faculty, and we have many people from other countries.

Mr. Holland. Foreign educated.

Mr. DuBridge. But if one looks at the top people on our staff, our six division chairmen, they are in charge of the major divisions, academic divisions, all of them were born, brought up, and educated in

the United States and a very large fraction of the top professors were also. We have some very fine men in the field of astronomy, in the field of biology, and in other fields that were borne and brought up in Europe. Some immigrated here in the war or in the Hitler regime. Others we have attracted over since the war because they were great scholars and we wanted them to come, but that percentage is relatively small.

Even in the atomic-energy field, if I may say so, though it is true there have been some very conspicuous leaders in that field from other countries, and we owe them an enormous debt for the people like Fermi and Von Neumann and other people of that caliber, at Los Alamos, it was directed by Dr. Oppenheimer, an American, born and educated in this country.

Mr. HOLLAND. He was put out of his job.

Mr. DUBRIDGE. That is right.

Some of the chief division chairmen were Dr. Bocker, from Cornell University at the time, now at Cal Tech; Dr. Bainbridge, from Harvard; Dr. Elsell, from California, and many others, all of whom are Americans.

So we do not need to hang our head in shame. We do owe a great debt of gratitude to some of these very brilliant people and are very fortunate that they came over, but by no means do these dominate the situation.

Mr. HOLLAND. I do not think we made the advance in science we should have made, considering the amount of money we had in education.

Mr. DUBRIDGE. If you look at the years, in 1925 we were far behind Europe in our advanced education in science. There is no question about that. But we have caught up, I believe.

Mr. THOMPSON. Will the gentleman yield?

Mr. HOLLAND. No. I want to make one statement.

I never made this statement publicly before. Are the newsmen here?

In 1944 I had the job of taking around the United States 14 so-called Soviet labor leaders. At that time we were all going to live in beautiful coexistence, if you remember. On that trip was a man named Netzoff, who is now the Deputy Foreign Minister of the Soviet Union and at the United Nations, who was a graduate of Carnegie Tech in Pittsburgh, who worked in the Jones-Laughlin Steel Corp., when I worked in the Jones-Laughlin Steel Corp., and who lived a few squares away from me. He was head of that group. He kept me awake day and night telling me what Russia was going to do in education and science, and I discounted it a great deal because I thought it was communistic propaganda.

He told me this: They were going to forget about educating nobility but were going to start to educate the ability. He also advised me that the men who were going to follow the science field did not have to be a member of the Soviet Party, that their pay as teachers would be 8 or 9 times what the pay of laborers would be in the Soviet Union. They were to be given the best house and they would also be given vacations at the best beaches.

He said: "You mark my words. We are going to be able to take our strong-backed Russians that you had and called hunkies in the

steel mills and educate them with the greatest education in the world. We are going to devote time and effort and give them all the encouragement in the world."

And I believe it is fairly the truth today that they have done that.

Mr. DuBRIDGE. Yes, sir.

Mr. HOLLAND. And they are not members of the party, even.

"We are not asking them to be members of the party. We are going to ask them to develop their brains and get a desire to do something great in their own name."

Mr. GWINN. In this connection, many of us would like to have gone to Cal Tech, and this is the only opportunity we are likely to have.

Mr. DuBRIDGE. Thank you. I am sorry you were not there, sir.

Mr. GWINN. In connection with what the gentleman from Pennsylvania says, isn't it true that Russian scientists for a long time back have developed special facility in astronomy and in this very field they now seem to be excelling in. That is, does this date back and has it been built on a traditional intellectual development in the particular field of science that we see manifested now?

Mr. DuBRIDGE. My impression is that before the revolution under the Czarist regime that Russia had an educational system somewhat like those of other European countries of the time which specialized on the nobility, the high class, members of society, but gave them a quite good educational experience through graduate school.

As a result there were a number of conspicuously good scientists, physicists, astronomers, mathematicians, especially chemists, in Russia before the revolution.

After the revolution I think the educational system, went through a very great upset and change and for a while they were developing their scientific and other educational fields. But they discovered, I think it was about 30 years ago now, that is, in the late twenties or early thirties that they must rebuild the educational system clear up through the top level. So I believe they started at the early grades, with this single purpose in mind of creating technicians and scientists and engineers for this regime, but started in their earlier grades and gradually built up and in recent years, since World War II, they have been giving special attention to the university, to the engineering schools, and to the graduate schools, and they have now built up quite good university and graduate work in the Russian universities.

So they are now turning out good scientists, and something which is new, good engineers.

In the old days Russia was not known for its first-class engineers. There were some good ones, but it was not known as a great engineering center. Since World War II they have concentrated on science, and engineering.

So the people who have done the rocketry, for example, are largely engineers, who have made practical the ideas of the scientists, and I think the surprising thing of recent developments is not so much that they have good scientists but that they have done such a good job in engineering, and production, which was not a spectacular achievement for Russia before.

Mr. GWINN. Thank you.

Mr. ELLIOTT. Dr. DuBridge, I want to express the appreciation of myself and each member of this committee for the very fine statement and the very fine help that you have brought us this morning.

We thank you very much. It was most kind, considerate and helpful of the understanding of our program.

Now, tomorrow we will hear the following witnesses:

Representative Adam C. Powell, Representative Coya Knutson, Representative Jack Brooks of Texas, Representative Thomas L. Ashley, beginning at 10 o'clock in the morning.

On Monday we will hear Adm. H. G. Rickover at 10 o'clock, February 10.

Monday will be the last day of the hearings until week after next on account of the celebration of Lincoln's Birthday, which will come in the middle of next week, and many of the Members desire to be absent at that time.

(Thereupon, at 12:25 p. m., Thursday, February 6, 1958, the subcommittee recessed to reconvene at 10 a. m. February 7, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

FRIDAY, FEBRUARY 7, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION
OF THE COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10:23 a. m., in room 429, Old House Office Building, Hon. Carl Elliott, presiding.

Present: Representative Elliott (chairman of the subcommittee on Special Education).

Also present: Representatives Bailey (chairman of the Subcommittee on General Education), Perkins, Metcalf, Thompson, Udall, and Gwinn.

Staff members present: Fred G. Hussey, chief clerk; John O. Graham, minority clerk; Charles M. Ryan, general counsel, Kennedy W. Ward, assistant general counsel; Russell C. Derrickson, chief investigator; Mary P. Allen, subcommittee clerk; and Robert E. McCord, clerk, Subcommittee on General Education.

Mr. ELLIOTT. The Subcommittees on Special Education and General Education, sitting together to hear the testimony on the scholarship loan, work study, and science teaching equipment and other subject matter embraced in thirty-odd bills pending before the committees, will be in order.

We are very happy this morning to have as our first witness Congresswoman Coya Knutson, Representative in the Congress from the Ninth District of Minnesota.

We are most happy to have you, Mrs. Knutson.

I personally know something about your interest in the subject matter with which the committee is now concerned. I am happy that you have that interest.

Mrs. KNUTSON. Thank you.

Mr. ELLIOTT. I know that you have pending before the committee a bill dealing, among other things, with a student loan program and that is a program that I too am very much interested in.

I have a bill that has a title providing for a program of student loans.

I might say, by way of introduction, that some of the best testimony this committee has received on the student loan program came from a citizen of your State, a man by the name of Mr. Risty, who works for the University of Minnesota, who has operated a student loan program there at that school over a period of several years.

On my right is Congressman Bailey, who is chairman of the subcommittee on General Education of this committee, and of course

you know the gentleman from Montana, Judge Metcalf, and the gentleman from New Jersey, Mr. Thompson.

With those preliminaries—and I might say I see we have copies of your statement, Mrs. Knutson—you may proceed in any manner that you may desire.

We are happy to have you.

STATEMENT OF COYA KNUTSON, A UNITED STATES REPRESENTATIVE FROM THE STATE OF MINNESOTA

Mrs. KNUTSON. Thank you, Mr. Chairman.

I really appreciate this opportunity to appear before your committee.

I would like to say, before I begin my statement, that we have with us this morning, Mr. Chairman, Mr. Asbjorn Barlup, a science editor of the Verden's Gang, a newspaper in Oslo, Norway.

He is with the Norwegian Embassy and he is here doing articles on science and the public.

I would like to have him stand so that you may see that he is here today.

Mr. ELLIOTT. We are certainly happy to have the gentleman visit this committee. If we can be of any service to you in providing information or otherwise, we would be happy to do so.

Mr. BARLUP. Thank you, Mr. Chairman.

Mrs. KNUTSON. Mr. Chairman, you know that Norway figures largely into my student loan program because that is where I have received this information.

Mr. Chairman, the problems facing education stir me deeply because I am a parent and a former high-school teacher, and because I realize the grave obligations of a Member of Congress in these times.

We are on that pinnacle of history from which we may descend to peace or war, freedom or serfdom. Our legislation on education will guide us from that pinnacle whichever way we see fit.

If the limited approach of aid only to students of the sciences is adopted, we face the future as a nation of dwindling culture and dwindling national prestige. Every great civilization has needed not only scientists but capable people in all phases of life—farmers, philosophers, historians, businessmen, teachers, musicians, and statesmen.

Broad education gives us understanding of ourselves, our world and our place and strength in the world. We have no need to fear Russia. Our country is rich in natural and creative human resources. We have just proved as we all knew we could, that we play in the same league with Russia scientifically though we're still in the cellar, educationally. Our Explorer—the third earth satellite—this very minute may be shooting 18,000 miles an hour over our deliberations. All we really need to fear now is ourselves, the return to complacency and our judgment in handling the overall problems. Only extensive education can meet the needs of the times.

The idea of loans to students for education is of some years' standing with me. As a high-school teacher I knew many capable seniors who were encountering difficulties in their efforts to go to college. Then I learned of a student from Norway who borrowed from his Government to attend the University of Iowa.

After my election to Congress, several constituents suggested similar ideas. When a representative of my office was invited to Norway by the League of Norsemen to speak on daily life in Norwegian America, I made the stipulation that in addition he was to study the Norwegian student loan program to the greatest possible extent.

Norway pioneered in student loans and my bill is patterned on the Norwegian plan with one major and some minor variations which I will explain more fully later.

Halfway measures and wishful thinking will not do the trick. Today everyone is talking about education. Everyone is talking about its importance in preparing America for victory in the cold war and ultimate victory for the free world in securing a lasting peace. There is no earthly reason why we Americans should go off halfcocked in 20 directions hoping to get ourselves out of our educational dilemma by wishful thinking and halfway measures. Let's get over our inferiority complex and get to work. And, if it's for education, let's spend the necessary money. Let's start "running scared." There are no two ways about it: unless we do enough for education in terms of energy, initiative, imagination, and dollars, we will have done nothing except further muddy the already muddy American educational waters.

During the 84th Congress, almost 3 years before Russia's sputnik got all America talking about education, I introduced the National Student Loan Act bill, (H. R. 11414), calling for a $10 billion revolving student loan fund. Again, last February, I introduced this same bill (H. R. 5479, 85th Cong.), again calling for the large, but really very small sum of $10 billion to set up a national fund from which our students can borrow against their future productivity for an education.

I believe the $10 billion figure is a good figure. In 1955, 1956, and early 1957 this figure was thought by some to be astronomical; how prophetic. Such a fund would be capable of continuing a stream of educated people for many years to come into our national life, to fill our scientific needs, our economic needs, and our cultural needs. Ten billion dollars compares favorably with the $14 billion to $15 billion GI education bill with its most satisfying results.

Here, Mr. Chairman, I would like to insert some figures that would break down the number of people that covered that particular amount of money at that time.

Ten million veterans have been trained under the GI bill. Of the 10 million veterans we have 500,000 as engineers, 250,000 as teachers, 170,000 as doctors, dentists, and nurses, and 115,000 as scientists.

This is making a total of $1,035,000 in that category, but it is very significant to realize that we trained 10 million veterans under this program.

At the present time, we have 3,068,417 students enrolled in our colleges and that was the 1957 figure.

The essence of my bill, H. R. 5479, is to give every student consideration and encouragement to attend school if he so wishes.

My bill provides for carefully selected members on a board who are sympathetic to student problems. When a student has proved passing grades he can borrow money for living costs, educational costs, and moderate spending money, without interest, while in school, with 3 percent interest and repayment starting 1 year after he graduates.

Intense interest has been shown in this plan. Last year President Eric A. Walker of Penn State urged student loans in a major address

here in Washington. The acclaim given the idea by such eminent people, plus the enthusiastic opinion polls throughout the country indicated to me this is a coming program.

The State convention of the Indiana Farmers Union passed a resolution endorsing the Knutson student loan bill. All Americans get free education through high school. But the student who is capable of college work, and can benefit from the higher salaries normally earned by college graduates, should be expected to pay his own way, unless he can earn his degree by exceptional scholastic achievement through scholarships or as a return for military service.

I may add right here, Mr. Chairman, that the figures prove that a college graduate earns $103,000 more in his lifetime than does a high-school graduate.

There is a new principle of economics in this proposal as revolutionary as installment buying. Twenty years ago a person was scorned in his community for buying on time payments instead of by cash. But borrowing against one's future productivity for an education is unquestionably here already, as indicated by public opinion on student loans.

Loan fund idea has been successful in Scandinavian countries.

My bill has the advantage of prior experience in Norway—the first country to use this principle. The Norwegian Government-loan fund for undergraduates was instituted in 1947 and adopted by Denmark and Sweden a few years ago, around 1954, I believe. The Norwegian plan has been most successful. It is so simple a plan that it can hardly go wrong—and the most important thing in that it can hardly go wrong—and the most important thing is that it is not a giveaway plan, it is a loan fund.

Norway gives long-term, low-interest loans to students at universities, colleges, technical institutions, and schools of higher learning throughout Norway and for study abroad. These loans are given without security and bear no interest during the study period.

The source of the funds under the Norwegian plan is the old-age pension fund. This is similar to our own social-security fund. In other words, the old-age fund serves a twofold purpose; it educates the youth, and upon repayment it cares for the aged.

I think that you will be interested in hearing more about how the Norwegian plan works. The Norwegian Parliamentary Act reads as follows:

THE GOVERNMENT LOAN FUND FOR UNDERGRADUATES

NORWEGIAN ACT NO. 2 OF JUNE 6, 1947

SECTION 1. The object of the Government loan fund for undergraduates is to lend money to undergraduates of Norwegian universities and scientific colleges, to students of teachers' training colleges, and exceptionally also to Norwegian subjects studying at similar institutions abroad.

Provided that the Parliament agree, the King in council can resolve that the object of the loan fund shall also include the making of loans to help students attain other higher education.

Money may be lent to applicants who are considered suited for such education and who are otherwise unable to procure the means required in a reasonable way.

The registered office of the loan fund is in Oslo.

SEC. 2. The loan fund is to have a capital stock and a reserve fund, made up of the capital granted or transferred by the Parliament. The loan fund shall not pay interest on these funds, which, in case of winding up, shall revert to the Eschequer.

So the money that is never used is returned there.

For the purpose of its business the loan fund may raise loans to an amount totaling up to eight times its stock capital. Due repayment of these loans shall be guaranteed by the Government, and they may be raised by issuing bearer bonds or by such other transactions as prescribed by the relevant Ministry.

The Ministry shall call the accounts in for audit, and shall supervise the management of the loan fund. Once a year an annual report and the accounts shall be submitted to the Parliament.

SEC. 3. For a period of 3 years the King in Council shall appoint 3 directors, each with their personal deputy, to conduct the business of the loan fund. Every year 1 of the directors and his deputy shall retire from the board; this shall be determined by lot the first and second year. For a period of 1 year the King in Council shall appoint 2 of the members of the board of directors as chairman and vice chairman, respectively. The remuneration to be paid to the directors shall be stipulated by the Parliament.

SEC. 4. As a rule loans may not be made for a period exceeding the usual duration of the education in question. The loans are repayable from such a date as specified by the board of directors, usually from a date not later than 1½ years after completion of the education, and total repayment shall, as a rule, have taken place within a period of 15 years.

No interest shall, as a rule, be paid on the loans till the education is completed. Later on, interest is to be paid by the Government. An additional amount, not exceeding one-fourth percent, may be charged to provide payment for administration expenses.

SEC. 5. The expenditure of the loan fund to cover the loss incurred because the borrowers are exempted from paying interest while carrying on their studies, shall be defrayed by the Government (op. sec. 4 hereof). The Government shall also pay that portion of the administration expenses which is not covered by the additional amount referred to in section 4 hereof.

SEC. 6. This act shall come into force as and when the King in Council shall decide.

The King in Council or the person or persons authorized by him shall issue the requisite regulations concerning the organization and transactions of the loan fund.

The regulations issued pursuant to this act are as follows:

SECTION 1. The board of directors shall be in charge of the capital of the loan fund and raise the necessary loans, subject to the approbation of the Ministry of Education and the Ministry of Finance (sec. 2, pars. 1 and 2, of the act).

It is for the board of directors to decide on the details concerning the bookkeeping of the loan fund, to conduct the administration from day to day, and to appoint the necessary staff. Wages agreed upon need the approbation of the Ministry of Education and the Ministry of Finance.

Minutes are to be kept of the proceedings of the board of directors. These minutes shall be signed by the directors after every meeting. A copy of the minutes is to be submitted to the Ministry of Education at the end of every quarter.

The number of directors who must be present to form a quorum is two.

The signature of the chairman, or the vice chairman in his absence binds the loan-fund. The board of directors may authorize one or more of the employees of the loan-fund to sign letters and other dispositions of daily occurrence. All signatures are to be countersigned by one of the employees of the loan-fund.

The board of directors shall decide to what amount the employees who are in charge of the cash balance, bank balance, bank deposits and other means belonging to the loan-fund, are to be required to find security.

The board of directors shall prescribe the forms for the applications for loans and for the bonds to be issued by the borrowers.

SEC. 2. The board of directors shall stipulate the total amount which the loan-fund may at any time lend to the undergraduates of the educational institutes referred to in section 1, pars. 1 and 2, of the act.

The board of directors shall also make decisions as to the interest to be paid on the loans and their repayment (sec. 4 of the act).

SEC. 3. Applications for loans are to be sent to the office of the loan-fund in Oslo or to such other institution as prescribed by the board of directors. If possible the applicants should hand in their applications personally. The office receiving the applications shall control that the forms are properly filled in and that all particulars are available.

If the applicant is studying at the Oslo University the office of the loan-fund shall submit his application to the relevant students' committee (see sec. 37 of act No. 2, of October 9, 1905).

The students committee shall make inquiries to ascertain whether the applicants have the qualifications required for obtaining a loan (sec. 3, par. 1, of the act) and if so, the committee shall suggest the amount to be lent, with due consideration to the total amount alloted by the loan-fund to the faculty or institute to which the applicant belongs (see sec. 2, par. 1, hereof). The application is then to be handed over to the financial board of the Students' Association in Oslo whose opinion is requested before the application is returned to the loan-fund.

With regard to applications from students at other universities, scientific colleges and teachers' training colleges the board of directors shall decide on a similar procedure.

SEC. 4. Loans are usually to be granted for a period of 6 months at the time. In stipulating the amount to be lent the board of directors shall take into consideration the cost of living at the place where the undergraduate is studying and the cost of the textbooks and other educational material that will be required. In addition to the money granted to him as a loan, the student should usually receive some allowance from his parents or family, and/or be in a position to earn something by his own work.

In accordance with provisions laid down by the board of directors, loans may also be granted for the conversion of other debt incurred for the same reason, provided that such older debt is especially burdensome for the undergraduate.

SEC. 5. Every sixth month the borrower must undersign a preliminary bond which is not to carry interest or to be repaid for the present.

The amount of the loan is to be paid to the borrower when the loan has been granted and the preliminary bond is found to be in order and duly signed. The payment to the borrower is usually to be effected by depositing the amount on a savings account under his name with a savings bank and by placing the depositor's book at his disposal.

The preliminary bonds are to be converted into a final bond, comprising all the temporary loans, either at such time as decided on by the board of directors or, at the latest, when the education is completed. On the amount of the final bond, interest and installments are to be paid as prescribed by the board of directors in accordance with the rules laid down in section 4 of the act.

SEC. 6. Undergraduates owing money to the loan-fund in accordance with preliminary bonds shall inform the loan-fund every sixth month before the 15th of September and 31st of January respectively, of their abode and address, and shall include in this report an account of how far they have got in their curriculum and when they expect to complete their education. The board of directors may prescribe a form of this report.

If such a report is not submitted in due time, the preliminary bond becomes payable.

What was the Norwegian experience with the act? In 1951, the News of Norway reported:

"In one of its first actions during the current session, the Norwegian Parliament unanimously approved a 1.5 million kroner (equivalent in American dollars is approximately $200,000) increase in the capital funds of the State Bank for Loans to Students * * *.

"REPAID LONG BEFORE DUE

"Designed to help students solve their economic problems during their studies, the bank has proved a success in the 4 years of its existence. In the fiscal year 1950–51, loans were extended to 36 percent of the total 12,000 students attending institutions within the scope of the loan bank. In the 12-month period, student loans totaled 6 million kroner ($800,000), compared with 3.3 million ($400,000) in the first year of operations. As of June 30, 1951, the bank had lent a total of 23.6 million kroner ($3 million) since it was established in 1947. Loans in 1950–51 averaged 1,785 kroner ($260) per borrower. Repayments totaled 650,000 kroner ($90,000), which is significant in view of the fact that only 246,300 kroner ($35,000) were due under the loan contracts * * *."

I might also add here, Mr. Chairman, that Mr. Barlup just said this morning that repayment was far beyond expectations of the contracts due.

And I would also like to mention here that the dollar spent in Norway has at least twice the buying power as the dollar spent in the United States.

They also have free tuition to all university students in Norway, and I understand that they are more frugal and their money goes a little further, so it is a great help.

In determining the size of the student loans, the state bank considers such factors as local living costs, available family support, costs of required study books, the economic conditions. Priority is given to youths who are willing and able to accept part-time work while studying so that their debt upon graduation may be held at a minimum.

The following table reflects data on the operation of the program during the year 1951–52:

	Number of loans	Total grant	Average loan per student	
University of Oslo	1,003	NKr1,637,850	NKr1,635	$233
University of Bergen	80	130,900	1,635	233
Colleges and institutes	1,124	2,550,050	2,270	324
Teachers training colleges	1,148	2,079,000	1,810	258
Technical schools	357	725,050	2,030	290
Other schools	294	528,100	1,795	256
Students abroad	397	854,400	2,150	308
Total	4,404	8,505,350	1,930	272

In the last column you will find the figures in the American dollars to the amount of loans in those various colleges and universities.

Commented George M. Wiley in his book on the educational system of Norway:

The State loan fund for students in the universities and colleges of Norway is regarded by many as one of the most significant events in Norwegian student history. * * * There can be no question but that this plant of a students' loan fund has done much to democratize the opportunities for university and technical education throughout Norway. * * * More young people of ability are now enjoying university training.

During the year 1951–52, 5,407 applications were received for student loans. Of these 4,403 were granted. The average amount of the loan approved for the individual student for the year mentioned was NKr1,930—

about $300.

During the year mentioned there were in attendance at the universities, the scientific colleges, and the teachers' training colleges, included in this list, a total of 11,100 students. This means that 39.7 percent or approximately two-fifths of all the pupils in attendance at these institutions during the year mentioned were receiving some aid through the student loan fund.

Without question, the student loan fund is one of the outstanding features of the program for higher education at the university and college level in Norway.

My constituents think that student loan act is a good idea.

Two years ago, after my original bill was introduced to provide the means for any person to go to college by means of interest-free

loans while in school, a poll was taken in Minnesota which gave the bill overwhelming acceptance.

A survey was conducted by the Minneapolis Tribune in 1956 among a cross-section of Minnesota adults. The newspaper opinion poll asked the following question:

It's been suggested that Federal or State funds be used for loans at low-interest rates to help young people attend college. Are you in favor of, or against, that idea?

The answers in percent were:

	Total	Men	Women
In favor	75	73	77
Against	18	20	16
Qualified	2	3	2
No opinion	5	4	5
Total	100	100	100

Colleges and universities over the country wrote to me in support of this legislation. The following are excerpts from letters I have received in support of my bill:

From the President of the Pacific Lutheran College, Parkland, Wash.:

I am confident that there will be little loss in trade by the Federal Government under such a program. Sometimes I think we should introduce a bill that would give to every good student coming out of the public schools a bill comparable to the GI bill now being enforced in our country. The Government can well afford to assume such burden, in contrast with the tremendously huge mammoth sums now being spent outside of the country where we get no returns whatever.

From Kansas State College, Manhattan, Kans.:

Far too few people in America today realize what an acute manpower shortage we face, especially of persons with college training for scientific, technical, and professional occupations. Our chief means of solving this problem is to encourage college attendance by all youth who have the mental ability to benefit from it. Studies show that only approximately half of such youth are now attending college. I am sure the legislation you propose would be most helpful in this regard.

From Marquette University, Milwaukee, Wis.:

I want to congratulate you on your efforts to establish a Federal loan fund program where students may borrow as long as their scholastic standings pass the minimum standards. * * * Certainly it would be of great advantage to many students who are in that financial bracket where they need the assistance of a non-interest-bearing loan to see them through to their college degree.

From Kentucky State College, Frankfort, Ky.:

I am in complete agreement with a national student loan fund for capable, needy, and deserving college students. My experience of 27 years in recruiting high-school graduates enables me to know the need.

From the University of Detroit, Detroit, Mich.:

I like your plan because the assistance given is in the form of a loan. The student really pays for his education, as he should, but at a time when he is able to do so.

This morning I received a telegram from W. A. Poehler, President of Concordia College, St. Paul, Minn.

With your permission, Mr. Chairman, may I insert it as a little testimony for this bill?

Mr. ELLIOTT. Without objection it will be included in the record at this point.

(The information referred to follows:)

FEBRUARY 6, 1958.

Mrs. COYA KNUTSON,
Representative, United States Congress,
Washington, D. C.

DEAR CONGRESSWOMAN: I was impressed and heartened by the report in the Minneapolis Star yesterday, February 5, on your plan to a $10 billion revolving fund for loans to college students. I would be happy to assist in developing support for your program from this area. You may quote me on the following statement:

"It seems poor economical reasoning to make it possible for the college student to purchase an expensive automobile with borrowed money and without a down-payment with banker's guaranteeing the loan when that same student cannot go to the average bank and receive a loan to finance his education."

Very truly yours,

W. A. POEHLER,
President, Concordia College, St. Paul, Minn.

Mrs. KNUTSON. In summary, I am an advocate of student loan legislation. All possible views and proposals should be given the most careful consideration. The important thing in student loan legislation is a logical, simple, and workable first step in the solution of our education problems. Four points are raised in my statement:

1. We've got to make available more than $1 billion of Federal funds for education. President Eisenhower's plan doesn't even go halfway. $10 billion student aid would be more like what we really need.

2. Scholarships are not sufficient. Scholarships are fine as return for military service and in recognition of outstanding scholastic ability and achievement. Loans will be far better for our Nation and the nature of our independent individualistic people.

3. A loan fund, on a revolving basis, has been proved successful. Norway's plan is an excellent example. While our social security fund is tied up, we can set up a revolving fund.

4. The American people will support educational loans. Educators like the idea and there is every reason why Americans can borrow from themselves to make America and the free world secure for tomorrow.

Mr. ELLIOTT. Thank you very much, Mrs. Knutson. I would like to ask you 2 or 3 questions in connection with your testimony.

First, do you feel that with a loan program there should go a scholarship program?

Mrs. KNUTSON. Mr. Chairman, yes, not possibly with my particular bill, but I think that scholarship bills have been a big help in the past and I feel personally that they do not go far enough. Many of our colleges are expending money for scholarships throughout every year and the latest figures I have on that, Mr. Chairman, are 190,000 scholarships granted by these colleges and universities in the United States and they amount to $45 million each year.

Now, if we could incorporate that into our student loan revolving fund, I think that burden should be taken off the colleges so they can expand as they see fit, because their teachers' salaries are inadequate, many of their operating facilities are inadequate, they need the ex-

pansion, they need the extra money and this way it could be incorporated I think to work very well.

Mr. ELLIOTT. Do I get the impression, Mrs. Knutson, from what you say, that such scholarships as the Government might see fit to provide should be given in the nature of prizes as advocated, for instance, yesterday, by Dr. Lee A. DuBridge?

He advocated a system of scholarships to be used as prizes to go to the students who ranked very high in scholastic achievments without any needs test whatsoever.

Do you conceive that scholarships should be given as prizes or should they be given on the basis of the need of the student for a scholarship?

Mrs. KNUTSON. Of course, I certainly do not want to discredit scholarships in any form or any manner, but I think that in this particular case if we want to continue a steady stream of people into our colleges to meet our cultural, our scientific needs and so on, we have to do better than a prize scholarship. It just does not go far enough, Mr. Chairman.

Mr. ELLIOTT. And you think it should be supplemented by a loan program.

Mrs. KNUTSON. I certainly do.

And I know there is a great deal of criticism directed at what you call free riders in this particular case because sometimes they do not develop responsibility and initiative as they should and in a student loan revolving fund where they have to pay back their particular money, they have already proved themselves to be acceptable and good sturdy citizens by being able to do that sort of thing.

Maybe I am not making myself very clear at this point, Mr. Chairman, but I think that the revolving fund would go a lot further.

Mr. ELLIOTT. We had testimony from your Mr. Risty, from the University of Minnesota, to the effect that the repayment of student loans at the University of Minnesota had been equal to the repayment of business loans and other loans to the First National Bank, I believe, of the city where the University of Minnesota is located.

Mrs. KNUTSON. That speaks well for the responsibility that these students have, then, in repaying this money.

Mr. ELLIOTT. It seems to me also, Mrs. Knutson, that a loan program is certainly in accord with the old American tradition of self-help.

Mrs. KNUTSON. That is right.

Mr. ELLIOTT. My bill on loans contains this kind of a provision; namely, that the loans be repaid 1 year following graduation over a period of 10 years at a rate of 2 percent interest, the interest to begin 1 year following graduation.

Mrs. KNUTSON. That is very good.

Mr. ELLIOTT. Do you think that sounds like a reasonable approach to the repayment problem?

Mrs. KNUTSON. Indeed it is, Mr. Chairman. In fact, in my bill I have been thinking about a 3-percent interest a year after graduation and after they have been on the job for 1 year.

Mr. ELLIOTT. Now, then, my bill has this further provision, that if a person who graduates from college through the use of one of these loans or as the result of the use of loan money desires to go into the

teaching field that his loan will be forgiven at the rate of 20 percent for each full year that he teaches.

You may not want to commit yourself on that provision, but I would like to have you think about it. It seems to me that that might encourage people to enter the teaching profession where the need, according to all the evidence we had, is very great.

Mrs. KNUTSON. Mr. Chairman, I think that would be an excellent idea. I think that this particular program or bill, whatever we have to work on, can have many good features put into it of that kind and we can still work it. It is a workable plan.

Mr. ELLIOTT. The gentleman from West Virginia, Mr. Bailey.

Mr. BAILEY. First of all, I want to compliment the gentlewoman for the very excellent presentation she made. There are a few questions that occur to me and one of them is this:

In the study of the Norwegian plan, what is the mortality of those loans? How many of them are unpaid? Do you have those figures?

Mrs. KNUTSON. Yes. I am glad you asked me that because the only ones that were not repaid by the students themselves, I must say, were the ones who had died. Otherwise they were repaid 100 percent.

Mr. BAILEY. Another question occurs to me. I note the chairman of the Subcommittee on Special Education suggesting a 2-percent interest rate. We already have on the books legislation to make loans to colleges for construction purposes. The interest rate there is 2.78 percent.

I am wondering whether the interest rate on loans of this kind to individuals might not be acceptable if it was probably in line with the rate we are charging colleges.

Mr. ELLIOTT. That is entirely possible, Mr. Bailey, and I think that is a subject that needs to be looked into carefully.

Mr. BAILEY. What do you base your request for $10 billion on? Do you have any figures to back that up?

Mrs. KNUTSON. I have taken those figures for the similar reason that during the GI bill we spent from $14 billion to $15 billion, Mr. Bailey, to educate 10 million veterans, and that is the basis on which I had based this $10 billion figure.

I have no means of breaking down the amounts of money and where they went. I know that is in the record. But I felt that if we could start at a $10 billion figure, it would not be too far off from what the GI bill has done.

I understand that in a review given by some of our corporations in these United States on the educational facilities they have provided, scholarships, and so on, that the colleges have a $3 billion and $4 billion operating expense.

Now, if we are to continue to have a stream of college students and to fill the needs of this country culturally, economically, and so on, we need to expand, and the figures that this particular individual gave was that $10 billion would be more nearly the figure that we should operate with.

Mr. BAILEY. Does your legislation contemplate the setting up of a corporation somewhat similar to the Commodity Credit Corporation?

Mrs. KNUTSON. Yes; it is similar.

Mr. BAILEY. With authority to issue bonds?

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Mrs. KNUTSON. I think that would work; yes. I am not too familiar with details like that, Mr. Bailey, but I know that it could be very easily worked out.

Mr. BAILEY. I know you are making provision there that the Government write the interest period for the period of which they are doing the studying.

Mrs. KNUTSON. That is right.

Mr. BAILEY. So as to relieve the student of payment of interest during that time.

Mrs. KNUTSON. But I might also add, Mr. Bailey, as far as the Norwegian students are concerned, they repaid their loans ahead of time and I feel that our people can certainly do the same. I am sure they would.

Mr. BAILEY. That is all.

Mr. ELLIOTT. The gentleman from New Jersey, Mr. Thompson.

Mr. THOMPSON. Mrs. Knutson, I like your statement very much. I commend you on it.

Mrs. KNUTSON. Thank you.

Mr. THOMPSON. I particularly like your courage. I see no reason why any specific figure should be arrived at.

Mrs. KNUTSON. I agree with you.

Mr. THOMPSON. You could set up a $10 billion fund and if it were more than adequate that would be fine.

Mrs. KNUTSON. That is right.

Mr. THOMPSON. The money would still be there. I think the essence of the thing, as you pointed out, is that we must make enough money for everyone.

Would you loan money to any student who was accepted by an accredited college or university?

Mrs. KNUTSON. Indeed I would.

Mr. THOMPSON. The student would then take his choice.

Mrs. KNUTSON. Yes; that is right.

Mr. THOMPSON. I have a loan bill, which I introduced, I think in the 2d session of the 84th Congress, and again in this Congress, which I do not think is quite as sound in many ways as the chairman, Mr. Elliott's bill, but it has a slightly different approach.

My loan funds would be administered through the colleges. The student is accepted in an accredited institution and goes to the institution, which handles the whole thing.

It seems to me the mechanics of the thing are not too important just so long as they are not too expensive. I see no reason why the interest should be over 2 percent. I would say that the interest should be limited to the actual cost of administration unless one conceived of a program which would pay for itself. In other words, the interest would keep adding to the total.

I was interested to read just the other day that the total expenditure in the United States on education from all sources and for all purposes, including capital improvements, is a mere $15 billion a year.

That much is spent on advertising, and of course $40 billion is spent on national defense. So that is one reason why I am particularly glad to see you ask for $10 billion and if you had said $20 billion I would be saying the same thing to you.

Mrs. KNUTSON. Thank you.

Mr. ELLIOTT. The gentleman from Arizona, Mr. Udall.

Mr. UDALL. I, too, have been impressed by the very resourceful and imaginative presentation.

We have had a lot of talk in the last few months about cooperating with our NATO allies and exchanging scientific ideas and sciences. Our colleague here exemplified that by attempting to borrow from the experience of Norway in the field of scholarships, and I think it is very admirable.

Mr. ELLIOTT. We, I think, have demonstrated to you, Mrs. Knutson, our appreciation for your fine, imaginative presentation of a subject in which the American people are deeply interested.

Thank you so very much.

Mrs. KNUTSON. Thank you for your courtesy.

Mr. ELLIOTT. Representative Thomas L. Ashley had been scheduled to testify today as had Representative Adam Clayton Powell. Both have sent word that it will be impossible for them to get here today.

Our next witness is Congressman Jack Brooks, a Representative from the Second District of Texas.

May I say to you, Congressman Brooks, that the members of these two subcommittees are happy to have you appear before us this morning.

We look forward to your statement. We recognize and appreciate the interest that you have in the subject matter before us.

Now, you may proceed, Congressman Brooks, in any manner that you see fit. I notice we have a statement. If you care to read the statement we would be most happy to hear you.

STATEMENT OF HON. JACK BROOKS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. BROOKS. Mr. Chairman, I would like to take this opportunity to thank you for inviting me to be with you this morning to take part in your consideration of our science education problems. And I would like to express my appreciation to you and your fine subcommittee for taking on your own shoulders the responsibility of working in this constructive way toward some practical answers to the problems our country faces in maintaining technological superiority in the world.

Your work along these lines is not easy. The subject is high controversial and in spite of repeated warnings by the leading scientists of our country, some critics persist in maintaining that there is no problem. However, I believe, if constructive legislation is approved from these hearings, The people of the United States will soon come to appreciate the efforts you are making here now.

Race for survival: Mr. Chairman, as every member of this committee already realizes, our country is engaged in a full-scale race for technological superiority of the world. This is a deadly serious race for the very survival of democracy, and it is obvious there will be no prize for second place.

The most important resource we have in our free Nation is talented young men and women. Perhaps the most important shortcoming we have let survive in America lies in our not offering sufficient encouragement for each individual young man and woman to develop his own God-given capabilities to their maximum extent.

This race for technological superiority has been called a war of the classrooms and the Communists boast they shall win this war. This is indeed a war of the classrooms; however, I believe that freedom to inquire and to think and to create is a superior climate for education than the climate of unnecessary regimentation if our young people are realistically encouraged to exercise that freedom.

Top students quit school: In a great deal of study of the educational opportunities in my own congressional district and over the Nation, one of the most disturbing facts I have reviewed is an estimate that fewer than one-half of the top 25 percent of our high-school graduates are obtaining the higher education needed for full development of their individual capabilities. It is also estimated that each year more than 100,000 high-school graduates capable of doing well in college do not attend college because of financial hardship.

College training is not essential to a useful and a full life in our country, but no one can deny that a person's contribution in life could be made significantly greater if he has had the opportunity to develop further his native abilities through continued education after high-school. And no one can deny that in this race for technological development, college training is necessary for our scientists, our engineers, our technicians, and our teachers of these subjects who will be leading our Nation in this race a few years from now.

Figures comparing the technical educational programs of the Soviet Union with our own give us a further clue as to why the Communists apparently have overtaken us in vital areas of scientific achievement. These figures have been compiled by responsible national and private institutions, and I feel sure the committee has already given them a great deal of study .

Teacher shortage. I submit, gentlemen, that these comparisons must not be taken as a wholesale criticism of our local school boards, our colleges, and least of all our teachers. We do not need unconstructive and unfair criticism of our school systems and the dedicated people who work in them. The shortage of teachers in scientific and engineering fields alone, both in our secondary schools and colleges, has reached the point of a national emergency.

It is difficult to estimate the number of additional science and mathematics teachers needed in our secondary schools. However, a recent survey of the United States Office of Education revealed that an estimated one-half of our high schools offered courses in chemistry, about one-half offered courses in physics, and about one-half offered solid geometry and trigonometry.

The paucity of qualified science and mathematics teachers is believed to be a prime cause of the complete absence of these courses in many schools and a basic reason that only a small fraction of students take these courses even when they are offered.

Best efforts needed: There is no single cure-all solution which will place the United States back in undisputed first place in the technological race for survival. But one factor in any solution is clearly apparent. To regain the undisputed lead in our race for survival and to retain that lead are going to call for the best efforts of every part of our society.

Educators, businessmen, labor leaders, industrialists along with political and military leaders are all going to have to make a significant

contribution. In this way I believe we can demonstrate that an accelerated program of science education can be developed in our country without destroying or endangering any of the democratic freedoms we are working to preserve.

In order to immediately begin a constructive program toward training more interested and qualified young people in scientific fields, I have introduced in the House of Representatives H. R. 9635, entitled "The National Science Scholarships Act."

Brooks' scholarship proposal: My proposal would provide a 6-year scholarship program for 20,000 new students each year who are qualified to work toward a bachelors degree in the field of science, mathematics, and engineering. Special encouragement is included in the bill to students who select required education courses as their minor subjects or elective courses so they will be qualified to enter the teaching profession upon graduation.

Interested high-school students over the Nation would take a uniform aptitude test. Then State educational agencies would provide for final award of scholarships to students making outstanding grades on the examination. The State agency would also consider the student's ability to finance his own college education wtihout scholarship aid. The 20,000 scholarships would be divided among the several States and Territories in proportion to the total number of high-school graduates in each State or Territory the preceeding year.

Once awarded a scholarship by the State, the student would be free to select his own college or university from an approved list of accredited institutions. Each student would be awarded an amount not to exceed $1,700 per calendar year to meet payments of tuition and fees required by the institution and to be applied to his living expenses and books.

Balanced program: To help the colleges and universities meet the additional need for laboratories, equipment, and other facilities to provide adequate training for national science scholarship students, my proposal would also include provision for extension of the college loan program administered by the Housing and Home Finance Agency to include these facilities. The appropriation, of course, would be considered in the annual budget for the HHFA by appropriate congressional committees.

This proposal is not one which will upset a normal, healthy balance between science and liberal arts students. As a matter of fact, if every one of the 120,000 scholarships were used to its fullest extent by able students who would not have otherwise gone to college, we would have an estimated increase for 6 years of about 19 percent of science and engineering graduates.

And as the bill states, its purpose is to encourage capable young men and women to continue technical education courses after high school and not to siphon off liberal arts students into scientific fields. Well-trained scientists and engineers can keep us in the race for survival, but it will be the responsibility of our liberal arts graduates—majoring in English, economics, government, or the social sciences—to solve the ultimate problem of world peace.

No Federal control: This bill, I would point out, in proposing a $100 million loan fund for the colleges and universities themselves (in title II), would not make our institutions of higher learning de-

pendent on, or controlled in any way by, the Federal Government. Many schools have already taken advantage of loan funds available under this program as now administered by the Community Facilities Administration for the construction of dormitories, cafeterias, and so forth.

The $100 million provided for in H. R. 9635 would be specifically earmarked for what we might call nonrevenue producing construction such as science laboratories and equipment. No direct income would come to the schools from these facilities. The schools would repay these low-interest loans out of their own available resources; the loans would, in other words, permit construction to proceed immediately on additional needed facilities.

I believe it is important here to point out that some colleges, most in need of assistance in construction, might not have available funds with which to repay these loans. The subcommittee might consider a direct grant assistance program along with this proposed loan program.

Congress can help: Scholarships and loan programs will not in themselves guarantee the United States technological superiority in the world. But I believe these two areas are excellent ones in which the Congress can add impetus to a practical program to strengthen our forces in the "war of the classrooms" without weakening our traditional concepts of local control of education.

Our efforts to assure the United States of technological superiority in the world are going to require the cooperation and coordination of every part of our democracy. Working together with this serious goal in mind, I believe this job can be done.

Mr. Chairman, over the past several months I have received comments on my own national science scholarship proposal, as well as the entire complex educational problem before us, from a number of leading educators and scientists over the country.

Other opinions: These gentlemen were quite frank in their appraisal of scholarship aid, and I want to say that they did not all agree that my proposal was adequate to meet the present emergency. However, I feel sure that the committee would want an opportunity to look over representative excerpts from their comments, and I include them at this point for the official record. And I might add that I feel sure that these gentlemen would not object to having their views presented before, and considered by, this committee.

Needless to say, scholarships for students who need funds to begin or complete their college education are much needed, and it would be in the national interest to assist in removing economic barriers which prevent students from completing their higher education.—L. A. DUBRIDGE, *president, California Institute of Technology.*

We favor scholarships that are of a lump sum nature, similar to the present Veterans' Administration program, with each recipient paying his own tuition and fees.—LOGAN WILSON, *president, University of Texas.*

It is my opinion that such a (scholarship) bill should include an equal amount to go to the school of the individual's choice to defray the cost of his education. The colleges are in need of help as well as the students.—W. LEIGHTON COLLINS, *secretary, American Society for Engineering Education.*

There are certain points in your plan which seem to me admirable. For one thing I like very much indeed the idea that students selected for scholarship aid, as a result of national competition, would be enabled to select their own colleges and universities.—V. BUSH, *Massachusetts Institute, of Technology.*

My personal view is that careful examination of the probable burdens placed upon the institutions of higher education by a sizable expansion of scholarships

and of the means of carrying them out is very much in order.—HENRY DAVID, *executive director National Manpower Council.*

I think that the legislation would be very much more useful if the scholarships were offered without regard to the student's field. I am delighted to see that you are including a means test in your proposal. The college scholarship service could handle this quite well.—BARNABY C. KENNY, *president, Brown University.*

This scholarship proposal is indeed a step in the right direction, and recognizes not only the general need for trained scientific personnel but also the ingredients by which awards of individual aid to higher education may be made operational.—NICHOLAS DEWITT, *Russian research center, Harvard University.*

In view of the serious situation in which this country finds itself, I expect we will have to limit these scholarships for the immediate future to those interested in scientific fields. The fact is, however, that the great problems of mankind cannot be solved by technicians or even by accomplished scientists. They must be dealt with by men and women of broad cultural accomplishments and wisdom.—EARL J. MCGRATH, *executive officer, institute of higher education, Teachers College, Columbia University.*

My suggestion is that this program be divided up more equitably between beginning men and advanced-degree candidates.—W. R. WOOLRICH, *dean of engineering, University of Texas.*

I am especially interested in your plan to set up qualifications for the uniform examination given throughout the Nation to high-school seniors. If the boys and girls from Texas are passing the examinations, while the boys and girls in Arizona are not—this would give major incentive to the citizens of Arizona to take a long hard look at their school system.—WILLIAM BENTON, *publisher and chairman, Encyclopedia Brittanica.*

And so, Mr. Chairman and members of the subcommittee, I offer H. R. 9635 for your consideration in your efforts to work toward a solution of this problem. I hope it will make a real contribution to the material you already have at hand and if I can be of any help in clarifying any questions you might have, I hope you will not hesitate to call on me.

Thank you very much for this time you have permitted me to appear before you.

If you have any questions, I would be pleased to try and answer them, realizing that you all are authorities in this field, and I am just a 1-year student on this particular bill.

Mr. ELLIOTT. I would like to ask the gentleman two questions.

My bill contains a provision providing matchable grants to the States with which to improve science teaching facilities and it is based largely upon an investigation which I made last year in several high schools in my district and a few others where I found that science teaching facilities or equipment were in some cases practically nonexistent and in every case appeared to me to be seriously deficient.

I ask the gentleman this question because I recognize his great interest in the study that he has given to the matter.

Do you think that that might be one way to meet the scientific deficiency in America, a practical way? I am speaking in terms of authorizing the appropriation of money to build up the laboratory facilities in the high schools all across the country to some reasonable degree of use and proficiency.

Mr. BROOKS. This is in high schools, not in colleges?

Mr. ELLIOTT. Yes, in high schools.

Mr. BROOKS. I have not considered the problem in detail at the high-school level and below in my current study, because I thought that was more or less covered in the other education bills that we had on Federal aid to education. As distinct from that problem I was trying to

consider the problem of higher education, that is, college level and above, although undoubtedly one of the basic problems in the scientific fields is that many of our students are not prepared as well as they could be for college work. I am no scientist. I am by profession a lawyer and a newspaperman. But the scientists I know have said that one of the basic problems is that the graduates of high schools are not well prepared. They do not have adequate background to really take advantage of a scientific college education.

So, certainly there is a problem there. Matching funds may well contribute towards its solution.

Mr. ELLIOTT. Also, my bill has a title providing for the grant of funds to higher institutions with which to do the same thing, namely, bring their laboratory equipment up to date and those funds are to be matched by the institutions.

Mr. BROOKS. On a 50–50 basis?

Mr. ELLIOTT. On a 50–50 basis.

Mr. BROOKS. This, I think, might be a practical solution to it.

I had suggested the loan program in my bill but as I got into it I got some interesting letters from leading educators who pointed out that the schools who had less endowments would be less able to take care of their commitments on a loan program for these nonrevenue producing facilities. It may well be that we should consider a grant or a partial grant, as you are in your bill, to take care of the average college institution of higher learning, and give it an opportunity to at least halfway meet the obligation that would be necessary to amortize and pay out a substantial loan for laboratories which are pretty expensive.

Mr. ELLIOTT. Has the gentleman given any consideration in his studies to a loan program for worthy and needy qualified students?

Mr. BROOKS. Frankly, I considered it very briefly and my conclusion was that a loan program was not the solution for this reason: I remember only too well when I went to college. I could have borrowed the money then from one of the existing scholarship agencies to go to college.

When I started to college you could have gone very handily for $100 a month, room and board and live first class. Since then it has gotten more expensive. But even then I was reluctant to go into debt to the extent of $3,000 or $4,000.

As I look back I think perhaps it was foolish. But I believe there are many loan funds now that are not fully utilized. I do not know what the extent of those moneys is but I believe there are now considerable funds available for loan purposes.

Mr. ELLIOTT. Let me say to the gentleman that our committee has looked into that question fairly extensively to date and here is what we find about loan funds. There are in total amount considerable loan funds. But those loan funds, by and large, are repayable at 3 months, 6 months, 1 year, 2 years. You almost never find one repayable in more than 2 years. That is, the great average of them are short term.

Mr. THOMPSON. There are $60 million of loan funds.

Mr. ELLIOTT. If there is $60 million my judgment would be that $40 million of that money would be payable in short terms.

I can hardly think of anything that a sophomore in college needs less than he does——

Mr. BROOKS. A 90-day paper.

Mr. ELLIOTT. A 90-day paper. That is right.

Mr. BROOKS. It would not help him much, would it?

Mr. ELLIOTT. One of the proposals we are wrestling with here is one that provides for repayment over a period of 10 years. And somebody figured it out. I had not figured it myself, but somebody figured out that $5,000 over a period of 10 years would repay itself with 2 percent interest, I think, at about $45 a month or something like that.

Mr. BROOKS. I think that that may well be true. I did not consider the total educational problem as you all have. I was thinking more in line of the emergency we now have on scientific education. That is the problem that I was attempting to deal with, that segment of it. It may be that a revolving loan fund would be desirable. In my own experience I have not found it was necessary. Mine is only a very limited individual's experience and may not prove true all over. There may be a need for a general loan fund.

Mr. ELLIOTT. The number of scholarships is some 20,000.

Mr. BROOKS. Twenty thousand scholarships for a 6-year period, that gives us 120,000 scientifically trained people, either for industry or the purpose of teaching. This would not bring about any great inbalance in the percentage of scientifically trained compared with English, economics, history, and social study majors. Neither would it detract from the need of the teachers. I think it will involve that, too. It will help the teaching shortage for these same scientific studies.

Mr. ELLIOTT. The gentleman from West Virginia, Mr. Bailey.

Mr. BAILEY. I have no direct questions to ask, Mr. Chairman. I feel more hopeful that we will get somewhere in the field of Government assistance in education when I realize a man is coming up from the South and advocating Federal assistance in any field of education.

Mr. BROOKS. I am from east Texas.

Mr. BAILEY. You are to be congratulated.

Mr. BROOKS. Thank you. You are very kind.

Mr. ELLIOTT. The gentleman from New Jersey.

Mr. THOMPSON. I, too, want to congratulate my friend, Congressman Jack Brooks.

I think that basically you have a good idea. I am sorry to have to take exception on the emphasis on science and engineering, because I am firmly convinced that if we have a need for scientists today—and I have repeated this so many times now that I am getting tired of hearing it myself.

Mr. BROOKS. I have not heard it and I would be delighted to hear it. The committee might have heard your statement before.

Mr. THOMPSON. But I just feel if the Soviets come forward and advance in the field of biology as great as there was in rocketry then we might have someone coming in and saying: "Let us educate 20,000 biologists a year." I think our people gravitate in line with their abilities to a variety of fields. I applaud this. I think it is superlative as far as it goes. I would be infinitely more pleased with it if it had 20,000 or 60,000 in addition for the humanities, because we need people who understand other human beings as well as mechanics and machinists and I know the gentleman recognizes that. I like again the part of your bill in which the student can select his own

institution as long as it is an accredited institution. I think that is essential to this program.

We have been talking, Jack, here, about a lot of tests to determine children's abilities and then guidance and counseling service. Mr. Elliott has it in his legislation and others have it.

Do you think it would be helpful in the selection of the people whom you are after to educate if they were tested at a relatively early age and given guidance all the way through school to lead them in the direction that you would like to see them go?

Mr. BROOKS. I would say it would be very helpful if they gave comprehensive aptitude tests at the earliest practicable ages in order that the students might know at an early age that they had more capabilities toward law than they did toward economics or they did toward mathematics, that they might use that as a guide for their own study.

From the standpoint of examinations in my bill and in any bill I think we should have a uniform examination that they would all take, not only to assure that we would get qualified candidates, but to serve as sort of a yardstick for our high school, for our local educational institutions.

I have a short paragraph to that very point from William Benton, the publisher and chairman of the Encyclopedia Britannica. I would like to read it again. He says:

> I am especially interested in your plan to set up qualifications for "the uniform examination given throughout the Nation to high school senior." If the boys and girls from Texas are passing the examinations, while the boys and girls in Arizona are not—this would give major incentive to the citizens of Arizona to take a long hard look at their school system.

This was just by example and it might be the other way around. It might be that those boys and girls in Arizona are passing with flying colors.

Mr. UDALL. It probably is.

Mr. BROOKS. While it could be those in some other States are not.

Mr. THOMPSON. Like those in West Texas, for instance?

Mr. BROOKS. That might be the case.

I think a uniform test would give us a basis on which to evaluate the job that our high schools and local school boards are doing without pointing out that some of them are not what they would like to be.

Mr. THOMPSON. I think there is fairly substantial agreement on this subject among members of the committee, and we are going to have testify the head of the educational service, that is, the organizations that do the college entrance board examinations, and all sorts of education testing and it is Dr. Henry Chauncey.

When he has told us their procedures and so forth, we will learn a great deal that will be of assistance to us.

I thank you again very, very much for coming and I think this is an excellent proposition.

Mr. ELLIOTT. The gentleman from Arizona, Mr. Udall.

Mr. UDALL. I have just a comment or two.

Our colleague from Texas is a very stimulating member, as we all know, and his presentation today here has, I think, been first rate. It is obvious, as usual, that he has gotten underneath the surface and

I think his proposal is going to be very helpful for us in drafting legislation.

Like our colleague from West Virginia, I am very encouraged because of not only the leadership being provided by our colleague who is chairman of the committee, but by the gentleman from Texas, because many have said there is more opposition to Federal aid in education programs in the southern part of the country than elsewhere and I think these gentlemen are proving that some of the best thinking is coming from that area and it is a very refreshing thing.

Mr. BROOKS. I would like to say in defense, if it is necessary, of those most wonderful citizens in the world, from the south, that elect Brother Elliott and myself, that I have had very little adverse criticism of my proposal from my home district where I discussed it with educators and school boards from over the district and then the press ran several stories on my proposal. Actually, we have had good reception for it.

I do not think there is any antipathy toward some sort of encouragement for young people anywhere in this country.

Mr. Chairman, I do not want to belabor the point. I am sorry I took so much of your time. I do enjoy visiting and I learned something myself. I want to assure you of my cooperation with the committee in whatever you feel is best to help solve this educational problem. I do not know whether we can get a bill passed. It is going to be a tough fight.

But I think, if you will just take my suggestion, if you at the soonest possible date get a bill out of your committee so we can start work on it on the floor and start getting some encouragement, I think we would have a chance, a real chance of passing it this year.

Mr. THOMPSON. Off the record.

(Discussion off the record.)

Mr. BROOKS. I want to thank you again.

Mr. ELLIOTT. Thank you very much, Congressman Brooks. Your testimony has been most helpful and we appreciate it very much.

The two witnesses that we have just heard are all the witnesses for today.

The committees will hear on next Monday at 10 o'clock Admiral Rickover and until 10 o'clock on Monday the committee stands adjourned.

(Thereupon, at 11:26 a. m., Friday, February 7, 1958, the subcommittees recessed to reconvene at 10 a. m., Monday, February 10, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

MONDAY, FEBRUARY 10, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION
AND SUBCOMMITTEE ON GENERAL EDUCATION,
COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittees met, pursuant to recess, at 10:15 a. m., in room 429, Old House Office Building, Hon. Carl Elliott, presiding.

Present: (Subcommittee on Special Education) Representatives Elliott (Chairman) and Green.

(Subcommittee on General Education) Representatives Bailey, Metcalf, Thompson, and Haskell.

Also present: Representatives Wier, Gwinn, and Holt.

Staff members present: Fred G. Hussey, chief clerk; John O. Graham, minority clerk; Charles M. Ryan, general counsel; Kennedy Ward, assistant general counsel; Russell C. Derrickson, chief investigator; and Mary P. Allen, subcommittee clerk.

Mr. ELLIOTT. The subcommittees studying the 30-odd bills before it dealing with scholarships, loans, work study, equipment for scientific education, in both the high school and the college, and with provisions pertaining to counseling, guidance, and consultation and others, will please be in order.

The committee is happy to have as a witness today Adm. H. G. Rickover, a graduate of the United States Naval Academy and Columbia University. Admiral Rickover is presently assigned to the Division of Reactor Development of the Atomic Energy Commission, and is also serving as Assistant Chief of the Bureau for Nuclear Propulsion, Bureau of Ships, Department of Navy.

Admiral Rickover has given much of his time to studying the educational problems of this country as well as to studying the systems of other countries in recent years.

He has distinguished himself in many fields, and we are delighted to have him here this morning.

Admiral RICKOVER. Thank you, sir.

Mr. ELLIOTT. With that as a background, Admiral Rickover, you may proceed in any manner you desire.

STATEMENT OF REAR ADM. H. G. RICKOVER, UNITED STATES NAVY, DIVISION OF REACTOR DEVELOPMENT, ATOMIC ENERGY COMMISSION, AND ASSISTANT CHIEF, BUREAU FOR NUCLEAR PROPULSION, BUREAU OF SHIPS, UNITED STATES NAVY

Admiral RICKOVER. I have no prepared statement, Mr. Chairman, but I believe that the work of your committee is about as important as the work of any committee in Congress.

I further believe that your work should not be predicated on the particular momentary requirements of defense, but that the subject of education can stand on its own feet. In fact, I believe that education is more important than the Army, the Navy, or the Air Force, or even the Atomic Energy Commission. It is on this basis that I would like to address myself to your committee.

We really have a much greater problem than defense, when we consider education, because in this rapidly spiraling technological period that we are in, no country can remain a first-class power unless it gives primary attention to education.

Furthermore, the people of no democracy can remain free and ignorant at the same time.

So we have the problem of what science is doing to us. We also have the problem of rapid depletion of natural resources. The only way we can lick that problem is through trained manpower. I do not mean only engineers and scientists, I mean in all professional endeavors.

Having said this, I would rather that you ask me questions. I think that I can bring my thoughts out best through answering your questions than through a prepared statement.

Mr. ELLIOTT. Admiral Rickover, the bill which I introduced provides for 40,000 scholarships to be awarded to the bright boys and girls who are selected by the State commissions.

Of course, that thought is predicated upon the fact that roughly a quarter of a million per year of our brightest students are not going on to college. The studies indicate that the biggest single reason that they do not go on to college is the fact that they do not have the money to pay the $1,500 or so that college education requires per year now. The scholarships are on the basis of $1,000 each.

The administration has before the committee a bill calling for 10,000 scholarships. It is thought according to the testimony of the Secretary of Health, Education, and Welfare, that those scholarships will run in the nature of $750 each.

Those scholarships would be awarded on the basis of need as well as brilliance or high intellectual capacity.

Would you care to comment upon those proposals as one of the means of attacking the educational deficiencies and shortages that the country finds itself faced with today?

Admiral RICKOVER. I believe that your statement that students do not go on to college because of financial need is only partly true. I think, perhaps, a greater reason is that the love of learning has not been instilled in the students by their teachers. This is not the teachers' fault, it is the fault of our system of education.

Although I thoroughly agree with the purposes of your bill, and it certainly would do a great deal of good, I do not think you are really hitting at the crux of our educational problem.

Mr. ELLIOTT. What do you think, Admiral, is the crux of the problem?

Admiral RICKOVER. The crux of our educational problem is pretty much a complete revision of our entire primary and secondary school system. I do not know whether you are really going to help that basic defect through your bill. In fact, I believe that there are certain aspects of your bill which may hurt.

For example, I think that by giving even greater control to the professional educationalist, you may be perpetuating a system which we should get rid of.

I agree with the purposes of your bill, but I would not let the control of it be vested by the State boards of education.

Mr. ELLIOTT. Admiral, what do you think of the provision for loans? My bill contains a provision for $40 million a year for loans to needy students, again to be selected by State commissions. There are other bills before the committee that have some similar provisions. Mrs. Knutson of Minnesota, has a bill that pertains to loans altogether. There are other bills of varying degrees.

What is your impression about a system of loans?

Admiral RICKOVER. I agree with your system of loans, and I think it is not entirely necessary that the Federal Government do this. I think there are some private organizations that would be prepared to advance loans to students, perhaps with some Federal guaranty, just as we guarantee savings in banks. I think there has been some start on that.

I thoroughly agree with all the purposes of your bill except one, sir, and that is to spend money on vocational training. I believe that vocational training can be done far better by industry than by any schools of the Government. We are cluttering up our schools with items which do not really belong there.

Outside of that, I agree with all the purposes except that one.

I do not agree entirely with your method of carrying it out.

Mr. ELLIOTT. You would say then, Admiral, that the title of the bill pertaining to vocational education you do not agree should be in the bill?

Admiral RICKOVER. No, sir. I think industry could do a much better job on vocational training and in a much shorter time than the schools. The public schools are not a place for that sort of a thing.

The function of the schools should be to train the intellect and not to train people in manual arts. I think this has been one of the big defects of our educational system, that we have devoted too much of our space and our teaching talent in that field.

Mr. ELLIOTT. Do you agree with my idea for a work-study program as contained in one of the titles of my bill?

Admiral RICKOVER. Yes, sir.

Mr. ELLIOTT. You agree with that approach to the solution?

Admiral RICKOVER. Yes. I will repeat, sir, aside from the vocational training, I agree with the purpose of your bill, but not in the manner of execution.

You might ask me what recomendations I would have for executing it. I would do it on a Federal basis. For example, you provide in your bill for the granting of congressional medals to high-school students who stand within the first 5 percent of their class. You may really be doing a great deal of harm there, because in some States, and I think right in your State, you might hurt your State, because I believe the attempt should be to upgrade the school system, not to hand out medals where the school system may not be the best one.

If the parents in your State found that their children were not as good as others, it might force your school system to do better.

You may actually hide defects by giving medals where medals are not due.

I would give them on the basis of merit, on a national merit basis, not by States.

Mr. ELLIOTT. Admiral Rickover, how would you go about upgrading the schools, as you speak of them?

Admiral RICKOVER. As an engineer, the first I would do would be to set up specifications. We have today about 50,000 school boards in the United States. I think that 20,000 of these take care of about 95 percent of the pupils. You cannot possibly have a decent standard for schools where you have 20,000 or more school boards who are not properly educated in the field of setting up standards.

There has been some start made toward alleviating this situation. I believe in Connecticut, about a month ago, they decided to set up State standards. There should be a Federal standard. This should not be binding on any State, of course. This should not be set up through the Office of Education. The Federal Government should set this up possibly through the National Science Foundation or through some group of scholars. They should set up a national standard for what abilities a high-school student should possess on graduation from high school or secondary school.

For the people who can pass these examinations, I would give a national medal. It should not be for those who happen to stand in the first 5 percent of a particular State.

I think this is the most pressing problem. The setting of standards could be solved in about 2 or 3 months, perhaps, with the expenditure of $50,000 to $100,000. It does not take much money.

We could find out what other countries have done, find out how they handled the problems, and then we could decide how to go about having our high-school students, at the time they graduate, equal, in scholastic ability, to the high-school students of other countries.

At the present time in many other countries the students of the same age of ours are about 3 years ahead. This is an intolerable situation at the present time.

Mr. ELLIOTT. Admiral Rickover, have you given any study to the Russian system of education?

Admiral RICKOVER. Yes, sir. I have given study to the Russian, to the English, to the Swiss, to the Swedish, to the Dutch, and to the French systems.

Mr. ELLIOTT. How about comparing for us, just briefly, the English system and ours? Are they relatively on the same plane or not?

Admiral RICKOVER. No, sir. They are on a higher plane than ours. The English system is a good one to compare with, because England faced about the same problem we did 100 years ago. They had the same problem of religious schools and Government schools. They solved that problem. I think what they did might be a lesson to us. We could borrow some lessons from them in improving our schools.

I think it was about 1840, before there were the beginnings of taking control of education away from the Anglican Church. This was not really effective until the educational law which was passed in 1902. At that time, public schools were finally set up in England. By "public schools" I mean real public schools, and not the private schools which are called public schools.

The debates connected with that bill were about the most stormy debates they had in over half a century in the House of Commons and in Parliament. But they finally hammered out a bill which provided for public education, with Government grants to assist public education.

There were two distinct provisions put in that bill which made it effective. One, they would give no money to any school unless they met standards. And not one pound was ever given to any school unless they met standards which were set up by the Government. Secondly, they reserved the right of sending inspectors to see whether the money was spent properly.

The first part can be done even in our Government. The second part could not be done.

However, these inspectors never told any school what to do. They simply went around and compared what went on in one school and another, and give them helpful suggestions.

The same system is in vogue in England today.

In addition, they set up a system for scholarships, not directly from the government to the schools or to the universities, but via a university grants committee which operates under the British Treasury. Thereby they provide an indirect method for handing out the scholarships, but they do not hand their scholarships to educationalists.

In my opinion, this would be one of the greatest disservices we could do in the country today, to strengthen the position of these boards of education who have been so largely responsible for the mess we find ourselves in today.

I think this is one of the most important things I could say this morning.

Mr. METCALF. Would the gentleman yield? I want to clarify something.

Mr. ELLIOTT. Yes.

Mr. METCALF You say "State boards of education." In many of the States, the State boards of education are lay groups consisting of maybe the ex officio members elected to office and certain appointed officers by the government.

Admiral RICKOVER. Perhaps I should express it a little clearer.

Mr. METCALF. Do you mean that, or do you mean the professional educator?

Admiral RICKOVER. The professional educators. I am sorry. I really meant that.

You see, in this bill that you have there is a means whereby the hold of the professional educators would be strengthened. I think this is something we must stop.

Mr. METCALF. Thank you, Mr. Chairman.

Admiral RICKOVER. Have I cleared that up, sir?

Mr. METCALF. Yes.

Mr. ELLIOTT. Admiral Rickover, would you proceed with your comparison of our system and the Russian system?

Admiral RICKOVER. The Russian system is essentially the European educational system. There is nothing peculiarly Russian in it. Russia, before the revolution, had started in to adopt the European system.

Would you care to hear something about the origins of the European's educational system?

Mr. ELLIOTT. Yes, a brief statement about it.

Admiral RICKOVER. The universities of Europe, of course, are a direct descendant of the Greek school system. The first attempt to have schools for the common people came with the Protestant revolution, because Luther believed and the Protestants believed man had direct access to God. They believed it was necessary for everybody to learn how to read the Bible. In order to study the Bible, they had to know how to read. Up to that time, the church had denied people permission to read the Bible.

So in 1524, Luther addressed a letter to all the officials in Germany, urging them to set up schools where all people could learn how to read. That was the beginning of the common school system.

That would have gotten along pretty well except a 30-year war came along in 1618, and that pretty much wrecked everything. Then when Prussia became a power, they instituted compulsory education for all the people. This was done by Prussia, not because Frederick I particularly cared about educating his people, but as a military necessity. He found that in fighting the wars even at that time, he had to train his people to read.

So they instituted compulsory education. That is, primary education, not university education.

That system went on until the Napoleonic Wars.

In 1806, when the French defeated Prussia, the Prussians realized if they were ever to become a power again, they would have to completely revitalize their educational system. So they revitalized or they changed many other institutions in Prussia. They put Von Humboldt, a nationalist, in charge of changing their school system. He introduced what is today essentially the European educational system.

Even when Germany was unified in 1871, although the constitution provided that each state would be responsible for its own education, they nevertheless, all of them, adopted the Prussian system because it was so good.

At the end of the war of 1870, the French adopted the Prussian system because they realized that one of the main reasons why they had been defeated so easily by the Prussians and why the Prussians had won the wars of 1864 and 1866 so easily was on account of their fine educational system. This Prussian system, this German system, has been adopted by nearly all of the western countries of Europe, including the British. It took the British 100 years to do it because of the clerical fight.

Getting back to Russia, before the revolution they also had adopted this system, and in 1914, when the First World War broke out, about 50 percent of the Russian children were attending elementary school, and a small number were attending universities based on the European system.

When the Bolsheviks seized power, they threw this all out. They wanted to set up a system where political dogma controlled, instead of the old system. This went on for about 15 years. Finally they learned that they could not carry out their 5-year plans with a political school system.

They adopted many of the ideas which had been taught in Teachers College at Columbia University. They finally found out they had to scrap that whole thing. They gave up Marxist dogma and went right back to the European educational system.

Mr. BAILEY. May I interrupt, Mr. Chairman, the gentleman from from West Virginia?

Mr. ELLIOTT. Yes.

Mr. BAILEY. Admiral, you are not suggesting we start a Bolshevik revolution in this country in order to change our educational system, are you?

Admiral RICKOVER. No, sir. I am saying quite the opposite. I was going to say that after they saw the failure of their Bolshevik school system, then went right back to the European system. They had enough strength of character, they had enough political realism about them, to throw out political dogma when they saw they could not carry out this industrialization of their country.

I am suggesting exactly the opposite.

Mr. GWINN. Will the gentleman yield?

Mr. ELLIOTT. The gentleman from New York.

Mr. GWINN. The inference might be that we have already the Bolshevik introduction of our bad educational system, and what the admiral is recommending is that we get back to the basic educational system.

Admiral RICKOVER. I would not call it Bolshevik, sir. Its effect might be the same; that is correct, sir. I am sorry I was misunderstood on that, but I can assure you I do not believe that.

Mr. BAILEY. Let me interrupt long enough to assure the Admiral that I was not under any misapprehension. I knew fully what you had in mind. I just raised the point to develop the situation a little more than it had been.

Admiral RICKOVER. They went right back to the European system. I, as I said, I believe that their leaders deserve a great deal of credit. When they were faced with a situation which they could not lick by force or by propaganda, it was insoluble by either of those methods, they went right back to a hard-boiled viewpoint and they started making their children work hard.

As a result today after about 25 years of effort along this line, they have a 10-year comprehensive school system which and in these 10 years they cover what we do in 14 years, what our children cover from 6 to 18.

Their children as of last year started at seven. This year or next year they will start at six, according to a new law. So they will be finishing by the time they are 16 or 17 what we finish at 18.

But at this age they will know what our college students know in their field at age 21 or 22.

This is the real significant thing that has not been understood. It is not a Russian system. It is a European system. The Europeans take another year or two to accomplish the same thing.

This fact has never been gotten across in the United States. We are always making a mistake by equating the European secondary schools with our high schools. There is no such comparison at all, Mr. Elliott.

When a student finishes a secondary school in Europe he is ready for professional work, which means the same as graduate work in this country.

This is the important point to remember, that we can gain 2 or 3 years in our educational system by studying other school systems and by adopting from them that which is best.

Mr. ELLIOTT. The gentlewoman from Oregon.

Mrs. GREEN. Admiral, I agree with much of what you say. There are a couple points of disagreement. Who is in charge of the educational system in Russia?

Admiral RICKOVER. The educational system in Russia is run from a central activity. It is run from the central government. It is in all the other countries too. It is in France and in Germany.

Mrs. GREEN. Who is in charge?

Admiral RICKOVER. I do not know the name of the individual.

Mrs. GREEN. Are the educators in charge of the educational system in Russia?

Admiral RICKOVER. No, the people in charge of the education in any of the western European countries, including Russia, are scholars, not educators.

Mrs. GREEN. You mean it is impossible to be an educator and a scholar at the same time?

Admiral RICKOVER. No, it is not at all impossible, but it generally is not true, because the educators as a rule are interested in the methods of education and not in the subject matter.

May I develop that point?

Mrs. GREEN. Yes, I wish you would because I am at a loss to understand your fine distinction.

Admiral RICKOVER. Let me try to explain that if I can.

This business of methods in education started with Rousseau, and was later take on by Pestalozzi, who was a Swiss, and who started this whole system of modern methods of education.

The intent at that time was that these methods would apply only to the kindergarten and not to the first six grades, because after that the important thing is the subject matter.

It really gets down to an issue: Do you teach the subject or do you teach the child? In Europe they teach the subject. For a man to be qualified as a teacher he must know his subject. The exception is in the first six grades where their emphasis is placed on teaching the child.

What we have done here as a result of Henry James and Dewey is to teach the child. This in my opinion is what is so deadly wrong with our school system. Our educators have become adept in teaching methods rather than in teaching the subject.

Mrs. GREEN. You make rather a blanket indictment of all educators of this country, do you not?

Admiral RICKOVER. Not all. Their problems are exceptions.

Mrs. GREEN. As an admiral if we had matters of defense to decide should we go to the experts in the military?

Admiral RICKOVER. Mrs. Green, are you not qualified to talk about a school system too? Does one have to be an educator? If I think something is wrong with the police system in Washington, am I not qualified to talk about it?

Mrs. GREEN. I think you are, but I think it is rather a serious charge to say that no educators are qualified to talk about education.

Admiral RICKOVER. I said there probably were some exceptions.

Mrs. GREEN. I do not understand. If we have problems as far as medicine is concerned would you not go to the doctors, the ones who are the professional doctors?

Admiral RICKOVER. But I notice that Congress has a committee that is studying that same subject. By what authority do you get into that? How is Congress qualified? I see in the papers you are studying these goof pills or whatever it is.

Mr. WIER. Tranquilizers.

Admiral RICKOVER. Of course you are as a citizen of a democracy entitled to question anything that is going on in Government.

Mrs. GREEN. Admiral, we do not disagree on that. The only point of disagreement is apparently your charge that educators are the ones who are not qualified to decide what should be taught in our educational system.

Admiral RICKOVER. I claim that they are not best qualified, Mrs. Green.

Mrs. GREEN. Do you claim that the doctors are not best qualified to discuss medicine then?

Admiral RICKOVER. Oh, yes; I do.

Mrs. GREEN. Do you claim lawyers are not best qualified to discuss legal matters?

Admiral RICKOVER. Yes, I do, because the lawyers and the doctors have a much better professional standing than educators. I would certainly agree with you that lawyers and doctors are better qualified. However, up to 50 years ago the doctors were not qualified, and it took Mr. Flexner several years until he cleaned up the mess in our medical schools.

There is no institution so hallowed that it cannot be judged by other people. Whenever you get to a point where you let the individuals in a given calling or profession be their own judges, you're in for trouble.

Mrs. GREEN. Do you mean that the doctors in the American medical profession are not?

Admiral RICKOVER. They are today but they were not at one time. It took a great deal of stirring to make them competent. I think the same type of stirring is necessary today in education.

Mrs. GREEN. I think we could reevaluate our educational program and perhaps do a better job.

I think we can always learn, but I certainly would take exception to your statement that the educators of this country are not the ones who are qualified to judge the educational program or to improve it.

Admiral RICKOVER. They are not best qualified.

Mrs. GREEN. Who is?

Admiral RICKOVER. There are too many vested interests.

Mrs. GREEN. Who would you suggest?

Admiral RICKOVER. I would take scholars.

Mrs. GREEN. Would you name scholars who are not educators?

Admiral RICKOVER. Yes, there are many of them. As a matter of fact there are very few scholars who would wish to be called educators.

Mrs. GREEN. Would you name some?

Admiral RICKOVER. Dr. Griswold at Yale is one. He is not an educator. He is a scholar. Dr. Teller is not an educator; he is a physicist.

I would have the various subjects which are taught in our schools judged by people who are professional in the subject, not professional in the method of teaching the subject.

Mrs. GREEN. You mean you cannot be professional in both?

Admiral RICKOVER. You can be, yes, but very few people are.

Mrs. GREEN. I think this is almost a cliché. I have heard it time after time in this committee. "Let us not leave it to the professional educators."

Admiral RICKOVER. That is right.

Mrs. GREEN. I think this cannot be documented. I think it cannot be established by fact. I think it is an emotional appeal. If there be weaknesses in our educational system today, and I grant you I think there are some, I think it is due not only to the deficiencies among the educators, but to the demand of other groups, to the demand of the military that we spend more money on the military and we do not spend it on education, to the demand of the chambers of commerce that we should not spend money on education, to the demand of the American Medical Association that we spend it on other things.

It grieves me to have people come and repeat time after time this cliché, that the people who are not qualified to work on the educational program are the professional educators.

I judge that president after president of the universities of this country who are charged with the responsibility of administering an educational program are honored to be called professional educators.

I suspect that the majority of the people in the country do not share that opinion that the professional educators are not the ones who should judge our educational system.

Admiral RICKOVER. That is the trouble in the United States, Mrs. Green, that the majority of the people in the country do not really know how bad our educational system is. That is the trouble.

I am not against educators if you mean by an educator a man who is proficient in the subject matter. But I am against people who just dabble in education.

Take a lawyer, and I imagine there are some members of this committee who are lawyers, are they judged by their tone of voice or how they act in the courtroom or are they judged by their knowledge of law?

Mrs. GREEN. Are you saying that a teacher's competency is entirely judged by his tone of voice and how he acts in the classroom?

Admiral RICKOVER. I said "teachers" not "educators." No, ma'am, I think teachers in this country deserve a great deal of credit. Perhaps you have been a teacher. I have great respect for our teachers. I think they have done a marvelous job considering the circumstances including salaries under which they have to operate. It is not teachers I am talking about, Mrs. Green.

Mrs. GREEN. Again you are distinguishing between a teacher and an educator.

Admiral RICKOVER. I am only distinguishing between teachers and scholars and on the other hand professional educators whose job it is to teach the methods of teaching rather than the subject.

I say that this is all right up to the sixth grade, but not beyond that.

Mrs. GREEN. Besides Dewey, would you name other people whom you call professional educators? I am curious about this.

Admiral RICKOVER. I do not think that in a congressional committee, having stated my opinion of educators, that you would want me to start in giving names, would you? I do not think that is a fair question.

Mrs. GREEN. I see no particular reason not to, because I think it is a blanket indictment that you cannot back up by saying that the professional educators in this country are not the ones who can judge the educational system.

Admiral RICKOVER. This is the very reason why your committee is meeting.

If our school system is all right you would not be wasting your time here.

Mrs. GREEN. I think you are wrong in that assumption, sir. We recognize deficiencies and we recognize a lack of money that has been spent on the educational program over a period of years, and as a congressional committee we are meeting to see if there is a Federal responsibility.

But we are certainly not meeting here on the assumption that our educational system is all wrong. I think that is not the assumption that this committee is operating under.

Admiral RICKOVER. I cannot answer to the committee.

The CHAIRMAN. I would like to say this to you, Admiral Rickover, that I really believe that the gentlewoman from Oregon was the type of school teacher who was good in the subject matter and good in the methods too.

Admiral RICKOVER. I believe that from the way she has talked.

The CHAIRMAN. I promised to recognize the gentleman from California, Mr. Holt.

Mr. HOLT. Admiral Rickover, I am sorry I came in late. I am not a member of the subcommittee. I am a member of the committee. I am here because of interest in hearing your testimony. I am sorry I missed your specific recommendations, but I will get a copy of the record and see what they were.

I gather, when I came in, you were commenting to a certain degree on the Russian system of education, or you referred to it.

Admiral RICKOVER. Yes, sir.

Mr. HOLT. Something has concerned me, having made a visit over to Russia and discovering that the things you learn are just about what they want you to learn, the things you see are about what they want you to see.

We have discovered lately that these folks are fairly capable in the art of propaganda throughout the world. I cannot ask what you commented on because I did not hear you. I would be curious to know whether you think we are getting the true picture of the Russian educational system.

I am not saying it is essential to have that to decide what we do, but it seems to be a factor now. Everybody is talking about it. I am curious because I saw so many of these people from Harvard and other places over there that were supposedly gathering data for this study. They had trouble getting around and getting answers to questions the same as I did.

Do you think we are getting a fair look-see to see what they are doing?

Admiral RICKOVER. I think we are getting the results of their system, what they have done, sir.

I mentioned this before you came in. It is not a Russian system, it is essentially the standard European educational system which has been fixed up. It has cut out all frills. It has cut out the things that we have in a democracy where we try to take care of the needs of the people themselves.

The people are being used by their government to make them preeminent in certain fields which are conducive to their military strength. It is obvious that they have done well in that.

What has come out of this demonstration is something that few of us ever wish to believe. We believe that it is impossible for people of scientific types to work under a system like that. We also believe that people who are to become professional, proficient, and outstanding scientists and engineers have to have freedom.

What the Russians have demonstrated is that for certain selected objectives, particularly with the subject taught that have no political connotations, it is possible to have very highly skilled people learn these things without the type of freedom we have.

Perhaps there is the desire on the part of some scientific people to escape into an ivory tower where they can do what they wish and not worry too much about what goes on in the rest of the country.

I think this is the danger that faces us. Certainly their people will not be taught to improve themselves as human beings, but they are being taught to produce potent weapons.

Mr. HOLT. I share your concern about the educators. I think of some of the people in our local school boards. I do not know whether you call them that, but that is what I would call the educators, to a certain degree.

Out in my district, in the San Fernando Valley, we are probably making as many of these missiles in other parts of country as in any place else in the country. We have 4,000 youngsters going to school at the building I got them, the old Birmingham Hospital.

One thing has concerned me, there will soon be 5,000 or 6,000 youngsters going into the school. Here we are spending all this money at other things around there, and these youngsters have nothing but a half a day of school.

What concerns me to a very great degree, not being a scientist at all, is can the local school system, can the educators provide the necessary equipment for these youngsters in the laboratories?

Admiral RICKOVER. Can your local system afford not to provide them, Mr. Holt?

Mr. HOLT. Frankly we can just barely afford to build the schools fast enough. We have a real problem, which is one of the reasons I am sitting on this committee, because I feel it is an overall problem.

Admiral RICKOVER. I think perhaps we pay too much attention to facilities rather than teaching. That is where we could save a lot of money.

I do not think the money is the entire problem with our school system. I do not think Congress is going to lick this educational problem simply by appropriating a lot of money. We always do

that. If we have a military problem we will appropriate another $1½ billion then that is finished.

If we have a school problem we think we can lick it by money.

I do not think that is the answer at all.

I do not think to improve our school system necessarily involves a great deal of money. As you know we are spending about 4 percent on education. The Russians are spending about 8 percent. We have about 5 to 6 percent of our students who get on to professional study, that is graduate study.

The Russians have 8 to 12 percent.

There is a country which has one-third of the national income that we have, the income per capita is about one-third, who spends twice as much as we do on schools.

But it is not all money. I think it is increasing the excellence of the teaching and making our youngsters work hard.

Here I would like to say something which I hope that Mrs. Green will agree with me. We are depending too much on the schools. The parents have a responsibility too.

We cannot send children to school for a few hours a day when the mother and father get off to work and put the whole load on the schoolteachers. They cannot carry that load, particularly when the average grammar school has about 27 or 30 children in a class. They would have to be superhuman to do anything like that.

We have gotten into the habit of just throwing the children off to school and depending on the school to perform all of the functions, not only educational, but moral and home training and all the rest of it.

We must deliberately take the excess things out of the schools and make them places where the children learn, and require the parents to assume their responsibilities as far as the children are concerned.

Specifically I would throw all of these fringe items out of the schools. For example, in one city in Illinois they have a course on how to tell when you are in love. I think there is a better place than a school to find that out. There is a more appropriate place to find out whether you are in love than the school system. It certainly has no place there.

I understand last week at a meeting of the President's committee at Yale, someone mentioned that one school had a course in "rest". You got credit for resting.

In Florida in one of the universities they have a course in fly-casting. The taxpayers should not pay for things like that.

Mrs. GREEN. Mr. Chairman, in order that the picture might be fully presented, I sat next to Dr. Harrison Brown of Cal Tech at the time he made the statement about courses in rest. At the same time he also pointed out that there are a tremendous number of high schools in the country which are doing a magnificent job of offering solid subjects.

It seems to me we are so inclined to pick out the exception. We generalize and say this is the kind of education we have in the United States.

I gave the example the other day. I have a sophomore son attending a public high school in the District of Columbia, who is taking Latin, biology, English, geometry, and algebra. There are hundreds of thousands like him who are also taking solid subjects and who

are getting a good educational program in the hands of the educators.

Now I am in agreement with the gentleman. I think there are deficiencies in our educational program. I think that the youngsters should work harder. I think they were inclined to get by the easy way. I think the demand of the parents in the community has done a great deal to water down the educational program.

Admiral RICKOVER. That is correct.

Mrs. GREEN. There is a responsibility we must all meet. The only difference that the gentleman and I have is his willingness to classify all school people or all educators as professional educators who cannot and should not be given the responsibility of improving the educational program.

On this I heartily disagree. I have a much higher regard—more respect for professional educators than does the admiral.

I would also agree with the gentleman that we cannot cure the deficiencies in the educational program just by the appropriation of money. However, I would not say that money would not help.

Someone has said, "We not only need a crash program in education, but we need a cash program in education."

Surely we could attract some of the best brains, the best scholars, to our educational system if we would offer the same kind of wages that industry pays.

Admiral RICKOVER. That is correct; I agree.

Mrs. GREEN. Or the same kind of wages that were paid in many, many other fields.

Admiral RICKOVER. Mrs. Green, if you and I could get together sometime I bet we would get along well on this subject. As you know, I have advocated that one of the first steps that I would take would be to immediately double the salaries of all teachers.

You know back in Imperial Germany before World War I university people used to be rated socially the same as Army officers, which was the highest social standing.

To give you an idea of what they thought of teachers, I wanted to bring that out. I think we should do the same thing in this country. First, we should make teaching a profession, which it is not really now; and we should make it the most respected profession in the country.

It so happens that in this country we judge people by the salaries they get. Therefore, I would immediately raise the salaries even if it included paying higher salaries than they deserve, because ultimately this would lead to attracting better people into the profession.

I am all for you.

Mrs. GREEN. I am interested in the gentleman's statement that in Germany they paid the teachers even as much as they paid the military people. Then following that a couple of sentences later he said, "even if some of the educators were overpaid."

Admiral RICKOVER. I did not say "educators." I said "teachers." You keep on confusing teaching ability with educational ability.

Mrs. GREEN. I am unwilling, Admiral, to determine the quality of an educational program by whether or not we win wars, or the quality of a teacher by whether or not he or she is paid as much as a military man.

Admiral RICKOVER. I did not say that on the basis of winning wars. I merely indicated that education was so respected in Germany that

in a military state they respected their teachers as much as their officers.

As you know at that time they had just as many freedoms in Germany as they had anywhere else or since in the world. It is not a case of respecting for military purposes, for they respected learning.

Mrs. GREEN. I thought earlier in your discussion you were talking about the fine educational programs they had in Western Europe. And then you followed it by "they won wars."

Admiral RICKOVER. No, I do not believe I said that.

Mrs. GREEN. Then I misunderstood you.

Admiral RICKOVER. I believe I said that after the war of 1870 the French recognized that one of the main reasons for their defeat was due to their poor educational system. They adopted the Prussian educational system. So did other countries.

It so happens that with the rapid advance of science and engineering you must be prepared on these subjects. You must place more emphasis on science and engineering than you would want to because of the possibility of losing a war. I do not like this.

My idea on education is that we should improve all types of professional education, not just science and engineering. I do not agree with that at all.

Mrs. GREEN. I am glad to hear you say that.

Admiral RICKOVER. If we talked long enough you will find that you and I are in agreement.

Mrs. GREEN. There are many areas of agreement.

Mr. HASKELL. May I say that this magnificent testimony of yours is like a breath of fresh air coming into this room. I really appreciate your wonderful mind.

Can I ask one question?

On the teachers' salaries, would you care to comment on what the Federal Government might or might not do on this?

Admiral RICKOVER. I would be glad to, sir. What I would do is to set up through congressional action a level of what Congress thinks or what the Federal Government thinks a good teacher who can qualify on a certain subject should get. It certainly should be at least as much as some young engineers get who have been out of college 1 year. It should be a good salary. It should be made a real profession.

Then for States that cannot afford it in certain selective subjects which Congress at a particular time thinks they're important, I would make up that deficiency in salary.

I would do that as perhaps a part of your bill.

This can be voluntary. That is, the acceptance of this additional salary can be voluntary. You can thereby preserve the supposed constitutional standing of this thing.

Incidentally, I do not fully agree that the Constitution prohibits help in schools. There is a general welfare clause in the Constitution. I think all of us are so afraid that people will be against what we are trying to do that you are hinging your actions here on defense and on State control of education. I do not think there is any particular virtue in that. Most other countries have found it essential to set national standards.

As I said at the beginning of my testimony, I think this committee could stand on its own feet. I think the job that you are trying to do here is more important than the job of any other committee in Congress that I know of.

If there were not enough money for this I would as a military man take the money away from a defense establishment. I consider education more important than current expenditures for defense.

Mrs. Green, how do you like that?

Mrs. GREEN. I like that from an admiral.

Mr. HASKELL. In the Federal bill you put up a pool of funds. Have you thought through the mechanics of that?

Admiral RICKOVER. Yes. You would probably have to limit it. I would limit it by setting standards. I would set up a Federal standard for teachers.

Mr. HASKELL. Salarywise and competencewise?

Admiral RICKOVER. Both have to go together.

Then if a teacher met that standard or competence and if the going rate in the State was not enough, I would make that up to the teacher.

Mr. HASKELL. As you know, 20 percent of our teachers today are not certified.

Admiral RICKOVER. Do not get me off on that subject because I will get into conflict with Mrs. Green again.

Mrs. GREEN. That is where I think we agree.

Admiral RICKOVER. Let me make this clear, sir. One of the things that they do in Europe in the western countries is that they have a standard for teachers. They have a standard for pupils who graduate from high school or secondary schools. They are given examinations.

If, say, 90 percent of the graduates of a secondary school cannot pass the national examination and there is a weighted mark there where they take into account what the student has done during the course, and they weigh that with the final examination, that is a bad mark for that teacher.

I would set up a Federal system of standards for teachers of a particular type in certain subjects which at a particular time the Federal Government has interest in.

Today you no doubt would say mathematics, physics, certain foreign languages, perhaps biology. I do not know which you would do tomorrow. If the teacher can pass these examinations, and if in the particular State the teacher's salary is not as high as another State, I would have the Federal Government make up for that salary.

Mr. HASKELL. Having set up these standards we would be short of teachers.

Admiral RICKOVER. I am sure it would not cost you a lot of money right away.

Mr. HASKELL. But you would have 40 children to the classroom.

Admiral RICKOVER. No, you cannot.

Mr. HASKELL. If you made the standards any higher than they are what are we to do for we cannot get over 20 percent certified. We agree in our objective.

Admiral RICKOVER. Suppose you start in making your standards say 80 percent or 75 percent as high as you would ultimately want them. In my opinion this is the best way you can start improving the American educational system.

Of course there is another provision in your proposed bill that you would let teachers study, you would pay their way to improve themselves. I am all in agreement with that. But then also give this guarantee that if they meet this standard you will take care of them financially. You will then start in getting good teachers.

Mr. HASKELL. Use the salary as an incentive.

Mr. WIER. May I ask a question? What would happen in many of our major cities where you have, let's say 50,000 more pupils where the schoolboards have the so-called automatic pay increase, and teachers get that added revenue as a matter of what we call seniority or moving along from year to year until they reach their maximum? Would there not be a question raised there on the initiative of the individual teacher as against the school board's policy of automatic increases?

Admiral RICKOVER. I think you would find, sir, that regardless of all these automatic raises that you give, we still treat teachers as secondary-class citizens. None of these automatic raises are enough to take care of what a good teacher, a qualified teacher, should really get.

I do not think there would be any conflict.

Ultimately I think that as you got more teachers of this type there would be a great demand for them, and it practically would force communities to pay their teachers higher in order to retain them.

Mr. WIER. Who would determine this teacher's added qualifications?

Admiral RICKOVER. There should be standards which are set up by the Federal Government. There is no other way you can do it.

This is done in every country in Western Europe. The standards are set up centrally. You cannot do it any other way.

Mr. WIER. I see the weaknesses of the automatic system. I served 9 years on the Minneapolis Board of Education. I have seen the weaknesses of an automatic increase, where a teacher who is much more efficient and probably more acquainted with the work than any other teacher gets the same automatic increase.

Admiral RICKOVER. Yes, you cannot help that, because if you start doing it in any other way it would probably lead to too much administrative chaos.

I do not think you will interfere with that at all because I do not believe that anywhere in the United States are teachers paid as much as the profession deserves. I did not say as much as the teacher deserves. I said as much as the profession deserves.

If you did set up these standards you would very quickly induce the teachers to improve themselves. You would also start to get people into the school system who are better. You would start to get more men in the school system, if you paid them a living wage.

I talked to one teacher in Maryland. This came up at a PTA meeting where he was chastised because he was not preparing the children for college. He said, "Why should I? I do not get paid enough to send my own children to college."

Mr. WIER. We will help them by letting them go to the universities and take up supplemental work.

Admiral RICKOVER. It is not enough. I think there is no question about it, we are not paying our teachers enough. This is one reason why we are in the dilemma we are in.

Mr. WIER. That is all.

Mr. HOLT. Admiral, while we are on the teachers subject, I think if I recall correctly the last time I saw the national chart my State of California pays teachers in the top five, I believe.

But as a practical problem when you go to writing legislation I agree with you. We are lucky the satellite thing came along. It gives us a chance to look at our educational system.

Admiral RICKOVER. That is the greatest service. It is a providential warning, if we heed it.

Mr. HOLT. I agree. I think leadership has to be shown by the Federal Government, if for no other reason because of our tax situation.

Yet, on the other hand, I have a feeling that the complete central system that the Russians have would eventually come to a weakness.

Admiral RICKOVER. Why do you not take the English, the French, the Swiss, or the Norwegian?

Mr. HOLT. I accept it and stand corrected. A centralized control. Really I feel it is our system versus a centralized system.

Admiral RICKOVER. It is not a centralized system, sir. You are setting up standards.

Mr. HOLT. I agree with the standards.

Admiral RICKOVER. The Federal Government should not go beyond setting up standards to reward.

Mr. HOLT. You mentioned money.

Admiral RICKOVER. But you are not forcing anyone to do this. They do in Russia and other European countries. For instance, in France, in any time of the day in any school in France in a particular grade the same subject is taught. I would not go that far.

I would leave the teaching up to the local schools. But by having standards for both teachers and for pupils you do make it possible for the parents to find out how well their children are doing.

This was my objection to this congressional medal for the top 5 percent of students in any high school because actually you may be fooling the people in that State. In some States where the standard is low you will be giving medals to people who do not really deserve it, and you may be doing harm.

I would do it on the basis of passing some examination which is set up through either some Federal agency or through some group of scholars appointed by Congress. I would not do it through the United States Office of Education, though.

Mr. HOLT. Let me ask the question this way: Let me once again express the problem I face, and I would like to explain it to my colleagues.

I think it is important that we have classrooms. It is ridiculous to offer a prize, as Dr. DuBridge says, to students who go to school only half the day all their life. Something has to be done for the schools out there.

We do not get 815 or 874 money. Do you not think it is important?

Let me ask the questions one at a time. If an area has a Federal impact growth of population, and they just cannot keep up with the school buildings, do you think something should be done by the Federal Government to assist?

Admiral RICKOVER. You are supposed to come from a very wealthy State, sir. What is wrong with your State supporting it?

Mr. HOLT. We are. We pay higher taxes. It will eventually meet our problems, but it is going to be 10 years off. We have to build a school every week in Los Angeles.

Admiral RICKOVER. You do not expect the Federal Government to do that, do you?

Mr. HOLT. They do it everywhere else on 815 and 874. In other words, one of my schools is in the county. They will get money to build. Another is in the city. They do not get money. In the city they go to school half a day, and in the county they go to school a full day.

Admiral RICKOVER. You are asking a question which really gets beyond my competence. In my personal opinion I would have the local community take care of the school buildings.

Mr. HOLT. What if they cannot? Do you think it is important?

Admiral RICKOVER. They might only have 1 car and 1 TV set, perhaps.

Mr. HOLT. I do not follow your answer to that question.

Admiral RICKOVER. I think if I were a parent I would skimp on an awful lot of things before I would skimp on my tax rates on schools.

Mr. HOLT. We are not skimping. We are paying more probably than anybody in the State. We cannot meet the influx. Have you been out to the San Fernando Valley?

Admiral RICKOVER. Not the San Fernando Valley. I hope I do not get in the same situation as I was with Mrs. Green.

Mr. HOLT. You are on your way, I will tell you.

Mrs. GREEN. If the chairman will yield, will you please clarify just what that is.

Mr. HOLT. What it was 30 minutes ago, Mrs. Green.

Admiral RICKOVER. Mr. Holt, I do not know enough about that particular problem to make a categorical statement on whether the Federal Government should support your particular school district.

Mr. HOLT. Say the whole country, not my particular area, then.

Admiral RICKOVER. As far as buildings are concerned, I am not too great a believer in large buildings or in fancy buildings for schools. You know they ran a test at Fort Belvoir several years ago. They took too groups of soldiers. They put one in fine buildings and another group in cold buildings. The ones that were uncomfortable did the best in their schooling. I think we could do much on this building business.

I think you could even teach in a barn, Mr. Holt. I would rather go to school in a barn with a good teacher than in a beautiful school with a poor teacher.

Mr. HOLT. I understand that program.

Admiral RICKOVER. Mr. Holt, you are getting me off into a subject in which I am really not competent—what function the Federal Government should have on buildings. I really do not know enough about that.

I think there is some Federal support. I have been concerned more with teaching and scholastic requirements than with buildings.

Mr. HOLT. Let me ask you a question on that subject.

Admiral RICKOVER. I am not helping you much in your district.

Mr. HOLT. Not at all. But that is all right. I am not helping you, either, so we are even.

Secondly, Dr. DuBridge, of Cal Tech, for whom I have a lot of respect, mentioned scholarships as more or less prizes for an incentive. Do you go along with that?

Admiral RICKOVER. Yes, sir; I do. I go along with all parts of your bill except the vocational-training part.

Mr. HOLT. That is interesting. I ran into a problem the last time I was selecting people for the Academies. These youngsters took my civil-service examination, and I got their high-school transcript and had two or three interviews with them in trying to select the best 10 or 15 out of 75 or 100 applications. Because of the educational concern, I even went into more detail than before.

I discovered that some of these youngsters had not only a desire to enter the Academy; there was a desire for scientific knowledge and education and, of course, a career.

There are about 10 boys who I am not going to do anything for who I would like to see go on to greater things in service to their country in science. Several of them, I think, really could do something for their country. They are going to be lost because of lack of scholarships out there in Los Angeles.

Admiral RICKOVER. I agree with you. If these boys are qualified, they should have scholarships. Yes, sir; I definitely do.

Mr. HOLT. I wonder if you got into that?

Admiral RICKOVER. No, no; I did not get into that part.

I agree with you on the basic issue that anyone who has the required talent, and if his parents cannot afford to send him to school, he should go to school by some other agency, even the Federal Government should pay for a scholarship. It is not a case of doing something for anyone anymore. We are doing something for ourselves. We just cannot afford not to do it. I do not think that we should consider on this program that we are conferring a great favor on anyone. I think we are doing something for ourselves, because we are not going to survive as a first-class nation unless we do it. I think this is the attitude to take.

Mr. HOLT. We are outnumbered.

Admiral RICKOVER. It is not entirely a case of being outnumbered. Wars today are fast and speedy. You have got to have fast and speedy ways of countering them. It is not entirely the number of people, the number of soldiers you have. It is whether you can exploit some new things rapidly. You can only do that by having a great deal of trained intelligence. This is what we are really going after.

Mr. HOLT. Quality?

Admiral RICKOVER. Yes, sir. We should consider this as a national problem. It is just as important to spend money on this as it is on immediate defense needs.

Mr. HOLT. I agree. That is what I was getting at as far as the shortages of school buildings are concerned, because if we are going to set up an overall program of quality, we want to assure quality for 10 or 15 years from now.

Admiral RICKOVER. I think as a rule it is probably easier for the Federal Government to help with the schools rather than with real estate. I am not too familiar with that. I am sure the members of this committee know more about that.

Mr. HOLT. Let me ask another question and then I will yield back to the floor.

To me it is vital to stimulate under our system of Government in this country the local State and the local school boards in taking action themselves and recognizing where they have had shortcomings.

Admiral RICKOVER. But they are not qualified to, sir. That is the trouble. The vast majority of the schol boards are not trained enough to know what a proper educational system should be.

In England in this educational reform of 1902, they abolished all the local school boards and they set up about 250 or 300 county school boards. They at least minimized themselves to that extent. They found they could not have a decent educational system with a large number of school boards.

Generally the members of the school boards are not by education or training qualified to judge. I think that is the dilemma that we are in.

Mr. WIER. Would you recommend the Virginia system?

Admiral RICKOVER. The Virginia one, sir? I am not familiar with the Virginia system, sir.

In Connecticut, as I mentioned earler, they are getting to the point of setting up a State standard. I think that is a very wise move, to do away with the individual opinions of school boards.

Generally when the State will set it up they will set up probably a better average standard than individual school boards would do.

Mr. HOLT. Have you given any thought to a national science academy? Would that be of any value?

I thought of this when I had this academy problem.

Admiral RICKOVER. I do not think that is necessary. I think we should try to upgrade all of our universities, both State and private universities.

I think they can take care of this.

This business of putting up a new academy here or there offhand sounds as if you would solve your problem quickly. I think you tend to forget a problem. You do something and you get it out of your mind.

Mr. HOLT. Rationalization.

Thank you very much.

Thank you, Mr. Chairman.

Mr. ELLIOTT. The gentleman from New York, Mr. Gwinn.

Mr. GWINN. Admiral, your statement about setting standards which the Federal Government would support by giving prizes would still make a demand by the Federal Government on the school system and would still be within the constitutional function of government to prepare and maintain our military or our defenses. Is that not right?

Admiral RICKOVER. Yes, sir. But I do not think you need tie it to the military, Mr. Gwinn.

Mr. GWINN. Unless you go over into the welfare clause as a source of your authority.

Admiral RICKOVER. You have done that before. You have the Smith-Hughes Act of 1917. You have the Morrill Act. You have done that.

Mr. GWINN. You immediately get into the problem of many, many fields where we are not doing too good a job. On that basis you could justify the Government going in.

The weakness of this whole business to me is that you set up a control or even a basic concept of education at a central point.

Admiral RICKOVER. You set up a recommended standard, sir. It is not obligatory.

Mr. GWINN. Still you are likely, in a political system like ours, to fall into the hands of the educationists who have already weakened our system thus far.

Admiral RICKOVER. Thank you, sir.

Mr. GWINN. You have a State system of education now really which creates the educationists or the professional or the monopoly power in that central group. So the United States Office of Education is one of that group.

Admiral RICKOVER. I would not have it run by the United States Office of Education or by any professional educators. I would have the standards set up by scholars.

Mr. GWINN. I understand that. How can we get what we want from our educational system? That is the question that we face and that is the question I think is not very clear. This committee is not going into the question of how good our system of education is.

I have been on this committee a long time. We have never inquired into what ails our education had as you have in your articles which I have read. We seem to lack the disposition and maybe power. We build on the theory that these local functions will function and will give us the product that we need without the Federal Government getting into it and telling them what and how.

There is a danger there, do you not think?

Admiral RICKOVER. You mean there is a danger in the Federal Government stepping in? The Federal Government should not tell them how. The Federal Government should say, "Here is a standard that we think is necessary for a modern educational system. This is what we think you ought to have." Again, leave it up to the States, but reward people, students and teachers, who can meet this situation.

Mr. GWINN. If you have a scholarship of say $1,500 for every high school, and there are 26,000 of them, do you think that would persuade every high school to get in line and teach these basic subjects?

Admiral RICKOVER. No, sir.

Mr. GWINN. Out of which the scholarship would come?

Admiral RICKOVER. No; I think the girl or boy who would make out best in that high-school class would get to go to college anyway through some other means. I do not think that the object is to try to get 1 or 2 or 3.

I would like to see a complete upgrading of our entire school system and to try to make is possible for everyone who is potentially qualified to meet his potential and go on to college. This is what I would like to see.

Mr. GWINN. Yes, but as I understand it we are not within gunshot of any such program as that.

Admiral RICKOVER. You never will be if you do not start. If you do not start arming yourself you will never be able to fight that war.

Mr. GWINN. You do not see any other way of developing this by emphasis, by publicity that we are getting today?

It ought to put this in the minds of the local school districts.

Admiral RICKOVER. Mr. Gwinn, I have been getting quite a bit of correspondence as a result of the speeches I have made. The general

tone is, "We want to do something. We want to do something and what shall we do? Many devoted parents have written to me. I do not know what to tell them. It certainly would do no harm to set up a national standard which is not obligatory to anyone, but at least to permit the parents to judge the efficacy of their own school districts.

If the children would have an opportunity to take the examination, then the parents could see how well their school system works. There would be great pressure on the school system to improve.

Mr. GWINN. If you set up that standard and you have some inducement for the boy or girl or the parents to put the child in the way of claiming that reward or getting that job that may be ahead for him, it would seem to me that might stimulate the whole system.

You could not have a system of education to make a few prize boys without affecting the whole system.

Admiral RICKOVER. This of course is one of the things you are attempting to do here, and as I said I am heartily in accord.

I have another point I would like to make.

About 75 to 100 years ago there was a great battle fought in this country to have free secondary public school education. That battle was won. But if we go on the way we are we will do away with our public-school system. The idea was in a democratic way to treat everybody the same, but if we go on the way we are now the wealthier parents will send their children to private schools and the public school system will suffer.

I don't know how true this is, but someone told me that in Chicago half the schoolchildren now go to parochial schools. That is not a true measure, but I think that more and more parents who can afford to are taking their children out of the public schools and sending them to private schools.

So in this way by not improving our school system we are defeating this very fine democratic objective that we had.

Mr. GWINN. I agree with you.

The enrollment in the private schools in the last 10 or 15 years has risen by 106 percent, the public schools by only 30 percent.

Admiral RICKOVER. This is not good, sir.

Mr. GWINN. Do you see any better work done by the private schools in your studies?

Admiral RICKOVER. I think they probably do better work because they are able to pay their teachers more. I think the results in the universities show that on an average, and this is considering a number of people who go to private schools and get into college, that there is a considerable greater portion of private-school students who make out better than the public-school ones. This is considering the number that went to the private schools in the first place, not on an absolute basis, because the number who compete, the number from public schools who compete to get into the Ivy League colleges is far greater than those from private schools.

In addition for this country to remain strong and great I think it is absolutely essential to do something to improve our public schools in order for us to remain a democracy.

Mr. GWINN. If this public-school system is as weak as you say, and as we fear, maybe we need a system of education to go back into private enterprise.

Admiral RICKOVER. No, sir. I think it would be very unfortunate to do away with our public school system, because it offers us the means for building up citizenship, for exchange in common experiences, to make one whole out of the people of this country.

It would be unfortunate to do that, sir.

We can stand a certain amount of private and parochial schools, but I do not think we should go back to that. I think it would be very unfortunate for the United States and it would be a divisive factor.

Mr. GWINN. Do you think the weakness at the local level is really in the school board or is it in the hierarchy of educationists who are in control of our school system really, and virtually in control of the school boards.

Admiral RICKOVER. I think it is the fault of all of us, Mr. Gwinn. I think the educational system has served the purpose for what we wanted out of it, for which it was intended.

It was perfectly all right for a time when the country was expanding and we had a larger number of immigrants who had to be taught civics and citizenship and so on.

I think this whole business has caught up and we have been aware of what has been happening in the world. We have used the scientific talent of foreign countries. It was possible to do that until World War II. It was during World War II that we found out we did not have enough of our own. Sputnik, of course, has put the cap on that.

Perhaps I should not be too strong about the thing, but it so happened about the time the public high school was introduced into the United States, about 1870 or 1880, that the whole business of progressive education started. It was a coincidence. I think this is what has caused the trouble. The influence of progressive educators has tended to hide the defects of the system. I think this is what has happened.

As far as I am concerned I would rather leave this on the basis that it is the fault of all of us, but we should now recognize the situation and take whatever steps are necessary to improve it if we agree that this is the most important thing that faces the United States. I have stated that I think it is.

How is that, Mrs. Green? Was that a good statement?

Mrs. GREEN. I think that is just excellent.

I think it is the responsibility of all of us.

Admiral RICKOVER. Surely it is the responsibility of all of us, even you too.

Mr. GWINN. You would be strongly against sending this money back to the 48 States and say, "You conduct your own tests and give your own scholarships?"

Admiral RICKOVER. I would, sir. I would be against it. I would be against sending any Federal money unless I was sure that it was being spent for the purpose for which your committee intended.

I would not hand out Federal money to anyone and let them do it as they wish.

Mr. GWINN. It seems to me, Mr. Chairman, that it might be comparatively easy, for this committee, to set up certain standards of performance and offer scholarships or prizes on performance on examinations.

Mrs. GREEN. Would the gentleman yield?

Mr. GWINN. I yield.

Mrs. GREEN. As a former—I hesitate to say "educator" or "teacher"——

Mr. GWINN. Say "teacher."

Mrs. GREEN. As a former teacher and as a present politician, may I say in all honesty that I would hate to see the 435 politicians in the House set up the standards for the educational system of the United States.

Admiral RICKOVER. Do not have the politicians do it. Why do you not appoint a committee?

Mrs. GREEN. That was his suggestion.

Mr. GWINN. This committee.

Admiral RICKOVER. May I attempt to modify your suggestion, sir.

Mr. GWINN. Surely.

Admiral RICKOVER. I would have Congress set up this council of scholars to set the standards. I do not think that Congress would want to do that directly. I agree with Mrs. Green on that. I would have this set up by a council of scholars. You might have the National Science Foundation do it. You might have some of the foundations and some of the large universities get together and nominate people to be on this council to set up this requirement or this standard.

How would that be?

Mrs. GREEN. I would much prefer that we have some people in the educational field, and I will not argue whether they are professional educators or scholars or teachers.

Admiral RICKOVER. Can't I ever get you to use the word "scholar"?

Mr. GWINN. I think I would accept that amendment to our bill, Mr. Chairman, to set up a foundation or assign this job not to the United States Office of Education, which is affected politically the same as Congress is.

Admiral RICKOVER. That is right.

Mr. GWINN. But set up the foundation that has scholars in it, I take it.

Admiral RICKOVER. They do that in England, and the people who serve on this committee are not paid. It is a committee on grants. With their system of government I suppose it is all right. It works directly for a government department. These people are not paid.

I am sure that there are plenty of people who are interested in this plan who would be willing to serve without pay on any such board.

Mr. GWINN. Is it not a fact that we know now substantially what those hard-core subjects are?

Admiral RICKOVER. No, sir; we do not.

I would strongly urge that there be an amendment to this bill that would provide for finding out what is done in foreign countries.

The excuse is given, "Well, if it is European or Russian, we cannot do it."

But you know, the sock was invented in Europe. People do not go around without socks. Glasses were invented in Europe, and we wear glasses.

Let us find out what the others do. The smart person finds out what other people do before he goes and does something because he saves himself a lot of time, money, and trouble.

Let us find out what the others do.

Mr. GWINN. Do you think scholars would give us other subject matter than is now being taught, say, in private schools?

Admiral RICKOVER. Yes, sir.

You do not have to take people from the private preparatory schools. I am sure if you took people from some of the leading universities of this country, not professional educators, and put them on this board, I think you would get a pretty good answer.

They would set up a standard which we should have. We might not be able to meet that standard, but it would be a goal to shoot for.

Would you agree with me, sir, that the children at the age of 19 should be as well educated as the children in western Europe at 19?

Mr. GWINN. Why, of course I do.

Admiral RICKOVER. That is all I am urging.

Mr. GWINN. You do not say how much time the children are in school over there.

Admiral RICKOVER. They are in school longer than they are here. Their vacations are shorter. They attend school generally 6 days a week. They do a lot of things that we do not do here.

Mr. GWINN. Is there any evidence that their system of education reduces juvenile delinquency compared to ours?

Admiral RICKOVER. I would say on the basis of the law of averages if the child were on the streets less and if he were in school more and studying, there would be less juvenile delinquency.

I think some of our juvenile delinquency is due to smart kids who are not being pushed and do not have anything else to do.

Mr. GWINN. Would you favor decreasing our age limit on the right to work for youngsters and let youngsters go into industry for this vocational education?

Admiral RICKOVER. Yes, sir, after a while those who cannot meet standards should. If it is pretty obvious that it does not do a youngster any good to go beyond 14 years I would let him out to go to work.

Mr. GWINN. Would you agree with that, Mrs. Green?

Mrs. GREEN. I think of a conversation that I had Saturday with a person from Oregon who said that within a short period of time we would have a 28 percent unemployment in our State. I am not sure that I agree that you can say to every 14-year old that if he cannot benefit by education the thing to do is go out and get a job.

Admiral RICKOVER. Are we to make our schooling a football of any transient situation that develops at anytime? We are talking about a basic educational system. On the basis of what you say when we do not have enough people to do a job then we ought to let children get out of school. That would be a logical deduction.

Mrs. GREEN. I think we should not water down our educational program to take care of the youngsters who are not academically inclined. I think the answer is in the vocational and trade schools which the American people have been unwilling to pay for because they are more costly.

Admiral RICKOVER. I will tell you from my experience with the vocational training program that I think for less than half the cost and less than half the time this is a job for industry to do.

As a matter of fact, much of what is called vocational training is really a waste of time and hurts. The type of people that you have teaching these subjects would never be employed by industry. They

could not get better jobs in industry at higher pay because they are way behind.

I do not think you are really doing the youngsters any good by keeping them in school to learn vocational material. They should learn that on a job. That is a part of industry.

Mr. GWINN. If there is something in a child to do a real job than to do a play job at school.

Admiral RICKOVER. We teach printing in the District high schools for one semester. I suppose at one time, one of the members of the board of education was a printer, so now we teach printing. I think that is a terrific waste of Government funds.

Mrs. GREEN. Would the gentleman yield?

Mr. GWINN. I yield. No more questions.

Mrs. GREEN. You say that you agree on the bill that Congressman Elliott has introduced. Do you favor a means test for the scholarships?

Admiral RICKOVER. The words "means test" do not strike me right.

Mrs. GREEN. Financial means.

Admiral RICKOVER. I think of Nicholas Nickleby or some of the Dicken's characters. It sounds like poorhouse proposition.

Mrs. GREEN. Do you think financial need should be one of the criteria?

Admiral RICKOVER. Certainly I do not think the Federal Government should pay to educate children of parents who can afford to send their children to school. I see no reason for that at all.

Mrs. GREEN. Let us take two parents. A Mr. X has been very thrifty, has saved his money, and has his home paid for, and each month has put aside money to send his youngster to college.

Mr. Y has spent his money as he has gone along. He does not have his house paid for. He has not saved anything for the education of his children.

If you require a means test, are you encouraging the person who is not thrifty?

Admiral RICKOVER. The quicker you get that child away from his spendthrift parent, the better off he will be.

Mrs. GREEN. You are not getting him away, are you?

Admiral RICKOVER. I think you can go too far into these things.

Generally, I think most self-respecting Americans would not particularly care to have the Federal Government pay for the education of their children. If the child won a scholarship on a competitive basis, that would be all right.

I think our whole system of paying tuition in colleges is wrong. There is no reason why the colleges and the universities cannot require that the boys and girls who go there, sign some kind of an agreement that after a given number of years, after they finish their education, they will repay the college for the excess cost.

Most State universities have a tuition of about $600 to $800 a year, and it costs them about twice as much.

I see no reason, since many of the students go to college in order to increase their earning power, why they should not pay this modicum back at some time.

Mrs. GREEN. You are in favor, then, of one criteria being the financial need of the students?

Admiral RICKOVER. Yes, I am. I would make it rather generous. I would not get into a means test or anything of the sort. I would be generous in the way I would go at it. I certainly do not think the Federal Government should pay for any youngster to go to college as long as he can afford to go. I would not want to.

Mr. GWINN. If you are thinking in terms of the Federal Government getting the very best boys we can get——

Mrs. GREEN. And girls.

Mr. GWINN. I mean for the military. I do not want the girls to get shot.

Admiral RICKOVER. I would make no distinction between boys and girls in this thing.

Mr. GWINN. You want the best boys and girls to get the scholarships. It is pretty tough on the boy whose dad has been frugal, as we say, and maybe has a little money. He will lose out in his efforts. He is an individual all by himself. Should not all boys and girls be free to compete for these prizes irrespective of their means, and will not the Government get a better result and the child be in a happier frame of mind?

Admiral RICKOVER. Then why do you not do this, sir, as a suggestion: Why do you not provide that over a period of years, the boy pays back the scholarship?

Mr. GWINN. That would suit me.

Admiral RICKOVER. Then you might get around it. You do 1 of 2 things. In most European countries now, higher education is cheaper than it is in this country. For example, in England about 75 percent of the students that go to Oxford and Cambridge, the Government pays to some extent. You will find, if you investigate this, that it is much easier to pay your way through professional training on the Continent than it is here.

In Russia, for example, they have made all education free. That is one way you can do it.

I do not think we care to do that, but you certainly could provide that if you give a scholarship to someone, and this takes care of the frugal and spendthrift parents, that over 10 or 15 years he pays this money back. There is nothing wrong with that.

I am sure your committee has the figures that college education is supposed to be worth.

How is that for an idea?

Mr. GWINN. I think it is good. Of course, we do have lending funds now that are not being used in the universities.

Admiral RICKOVER. May I make an observation along this line? I think the reason that we can be so free with spending money today is because we do not realize we are really using up our capital in this country. We have all the success money, and it is pretty easy for Congress to do its job on appropriations. They are using up all our natural wealth.

You could do this thing one way or the other. I think if you look at it from a long-range viewpoint, we are not being frugal as a Nation. The reason we can increase our current income is not because we earn it from our own efforts. It is because we are using up our vast natural resources.

Mr. GWINN. I agree.

Admiral RICKOVER. From that standpoint, I think it would be a good idea to start being frugal in the Federal Government. We are teaching a lot of people bad habits.

Mr. GWINN. How about these industrial scholarships like Westinghouse? They are picking out and offering scholarships to young men and women.

Admiral RICKOVER. They figure for outstanding people that it is worthwhile for them to send these people to school at their own expense and pay for them.

Mr. GWINN. With all this talk we have had in the country now, we are alerted to our problem. Do you think if the Federal Government does not come forward with some kind of a political scholarship program, that foundations and private persons and industry will?

Admiral RICKOVER. Not enough, sir.

Mr. GWINN. You do not think they will?

Admiral RICKOVER. No, they will not.

I think the aim should be that anyone who can meet the qualifications must go to college, unless he does not want to. I think many do not go because they are not sought out early enough, they are not imbued with the idea. Their time is wasted in the early years.

I think we should try to bring a situation around that every child is urged to work harder and go on and do more, and make sure that all who are capable go to college. It is more important to have them go on than it is to be concerned about the method.

Mrs. GREEN. If we venture into a scholarship program, do you think we will get any youngsters with exceptional ability into the colleges who would not otherwise go?

Admiral RICKOVER. Yes, I am sure that you will, because I think there have been many evidences that there are youngsters who are good. You know, of course, the figure of the 200,00 of the top 25 percent from the high school classes. But I think there are many other youngsters who are ruined in the early years who could do a pretty good job.

Why do you not set up the national standard and see what you get? You may find instead of handling this money out to State educational groups and setting up a standard as a Federal proposition, you will be giving it to people who deserve it. You are accomplishing your purpose. You are making sure that there is no waste in it.

Mrs. GREEN. We seem to be in agreement that the most important thing is to improve the intellectual climate.

Admiral RICKOVER. Yes, ma'am.

Mrs. GREEN. We should increase the love of learning. We should eliminate the anti-intellectual feeling in the country.

Admiral RICKOVER. Yes.

Mrs. GREEN. I am wondering if perhaps we cannot do better by reducing college expenses and paying something more to teachers. Then the colleges would assume the responsibility of screening and admit the more capable students.

Admiral RICKOVER. What I said about secondary schoolteachers, Mrs. Green, I would apply anywhere. I would apply it to college too. I think the colleges can improve the situation. They could make students make deferred payments for the cost of their education which they do not pay currently.

You cannot do that in the secondary schools. That is why it is important to start with the secondary schools.

I think our graduate schools are fine. They are as good as any in the world. Our primary and secondary schools are not. That is where the advancements come.

Now it is high schools. I think that perhaps equally important are the grammar schools.

Mr. ELLIOTT. Admiral Rickover, I want to thank you on behalf of the two subcommittees who are hearing this problem for your information, suggestions, and recommendations. They may not have met with universal agreement, but they have caused us to think. For that we can express our appreciation.

The next meeting of the subcommittee will be next Monday on the 17th of February, at 10 a. m.

The witness to be heard at that time will be Mr. Devereaux Josephs, recent chairman of the President's Committee on Education Beyond the High School.

(Whereupon, at 12:04 p. m., the subcommittees recessed, to reconvene at 10 a. m., Monday, February 17, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

MONDAY, FEBRUARY 17, 1958

HOUSE OF REPRESENTATIVES,
COMMITTEE ON EDUCATION AND LABOR,
SUBCOMMITTEE ON SPECIAL EDUCATION AND
SUBCOMMITTEE ON GENERAL EDUCATION,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10:20 a. m., in room 429, Old House Office Building, Hon. Carl Elliott presiding.

Present: Subcommittee on Special Education, Representative Elliot (chairman).

Subcommittee on General Education, Representative Wainwright.

Also present: Representatives Weir and Gwinn.

Staff members present: Fred G. Hussey, chief clerk; John O. Graham, minority clerk; Charles M. Ryan, general counsel; Kennedy Ward, assistant general counsel; Russell C. Derrickson, chief investigator; and Mary P. Allen, subcommittee clerk.

Mr. ELLIOTT. The Subcommittee on Special Education and General Education of the House Committee on Education and Labor will be in order.

We will proceed at this time with testimony pertaining to one of the some thirty-odd bills that are now pending before the committee.

The bill we will hear this morning is that of Mr. Multer, a Member of Congress from the State of New York. Mr. Multer is with us and I would like to say on behalf of the subcommittee to the gentleman from New York that we are very happy to have you and we are happy to have this interest demonstrated, and particularly this morning.

Mr. Multer, to tell you the truth about it, when I left home a little while ago I doubted if you would be here.

Mr. MULTER. Mr. Chairman, I appreciate the opportunity to be here and present my views to you. I came down yesterday and spent 7 hours on a 3½-hour trip in order to be with you this morning. With the weather what it is I am surprised that any of us have been able to get here.

I am sure that Congressman Wainwright must have flown in 2 days ago to be here.

If it is agreeable to you, Mr. Chairman, I will read my prepared statement.

Mr. ELLIOTT. You may proceed.

STATEMENT OF REPRESENTATIVE ABRAHAM J. MULTER

Mr. MULTER. Many words have been written on this subject in the past few months. I will limit my remarks in the hope that this committee and the Congress will soon substitute action for words. To my

mind there is no more important action that this Congress can take than to enact a Federal aid to education measure. This would go to heart of the problem pointed up by sputnik and in the long run contribute more to the strength of our country than having any number of spheres circling the earth. We will miss the boat and perhaps even the spaceship if we are satisfied with crash programs in weapons and satellites which will provide only temporary strength. Gentlemen, you are now considering the very future of this country. I hope only that my bill and my testimony this morning will be of some assistance to you in successfully discharging this task.

The purpose of H. R. 821 is to furnish loans to the country's needy and scholastically qualified students so that they may continue their education beyond the high school. State agencies will select the students to receive these loans.

Mr. ELLIOTT. Let me interrupt at this point and ask this question: Is your bill limited altogether to loans?

Mr. MULTER. Yes, that bill is limited just to the loan program.

Mr. ELLIOTT. How much is there in the loan program? How much is the authorization?

Mr. MULTER. I suggest in my bill a starting point of $5 million. It is a starting point.

The amount of money available to a State would be determined by the ratio which the number of its members in the House of Representatives bears to the total number of members from all the States which have accepted the provisions of this act. My proposal, if enacted, would authorize for the Federal scholarship fund the sum of $5 million for fiscal year 1958 and $10 million for fiscal year 1959 and such sums as are necessary for succeeding years. For a student to be eligible for a loan, his State must designate a State agency and establish certain methods and standards of selection.

Moreover, the Commissioner of Education may suspend loans to students if he determines that the State agency is discriminating against individuals on the basis of race, creed, color, or national origin. The State will only be required to make certain deposits into the Federal scholarship fund if the fund is not self-sustaining, but in no event can this State payment exceed 10 percent of the amount of advances made to students from that State during the preceding year.

The Federal Scholarship Act would loan to an eligible student an amount not in excess of $1 thousand a year for the first 4 years of study in any educational institution of college grade studies. In addition, the bill would provide $1,500 a year for 4 years to students in graduate schools.

Repayment of the loan by the student will be over a 10-year period with interest at 1 percent per year.

Let me review briefly the reasons such a program is needed. As you know I have supported such a program for years and first introduced this legislation in 1955.

Recent events have dramatized the urgency for such a program, which is long overdue. The reasons we must now enact a Federal education program fall into four categories, viz, security and defense, rising costs of a college education, the requirements of a free democratic society and the moral obligation of the Government to the youth of the country. I shall discuss each of these briefly.

(1) Security and defense needs: There is no reason for one to discuss this in detail. In recent months the facts and arguments have been well publicized. We are not developing to their fullest (neither quantitatively nor qualitatively) our most valuable natural resources; human talent, ingenuity and skill. And this is true in all fields, not just physics and mathematics. The Commission on Human Resources and Advanced Training concluded in 1954 that—

> The Nation is producing enough persons competent for higher education to meet the demands for specialization in all fields.

In other words we need not emphasize one or two fields of study if we do something about the fact that fewer than half of the upper 25 percent and only 6 out of 10 of the top 5 percent of high-school graduates are obtaining the higher education which would enable them to develop their full potential. Other studies indicate that with aid available for study in any field, more than half of the students would pursue careers in teaching, engineering, and scientific research.

Congressmen should be well aware, as are most scientists and educators, that successful solutions of our national problems are equally dependent upon the contribution of biologists, medical doctors, lawyers, economists, social scientists, and the like. If we overemphasize a single branch of learning we will probably create as many problems as we solve.

(2) The rising cost of higher education: If we review briefly the yearly income of the great majority of American families as compared to the present average costs of attending college, there can be no doubt that a financial barrier exists for many bright young students.

In its current population reports, the Bureau of the Census estimated that in 1956 there were 23 million families that received a yearly income of $5,000 and less, 7 million families had incomes of $2,000 and less. Now, a recent report of the United States Office of Education states that the cost of attending undergraduate college in 1956–57 averaged $1,500 a year at public institutions and $2,000 a year at private institutions. I will not belabor the point. The facts speak for themselves. Most of the children of these families cannot financially afford to attend college. The Congress of the United States cannot afford to allow America to draw her future brainpower only from the economically favored few. As we all know there is no correlation between a family's income and the capabilities of its children. Tens of thousands of capable high-school students fail to enroll in colleges each year for financial reasons. We must rectify this situation.

(3) The point clearly emerges from this, gentlemen, that our ideal of equality of opportunity conflicts with the situation which we are allowing to persist. Let us recall that education is essentially the communication of a society's culture or way of life. As our western culture becomes more complex, higher education becomes more important. We have progressed from a system of education solely within the family to one where it requires 16 to 20 years of formal education to acquire specialized knowledge.

Therefore, to deny financial assistance to capable, needy students is to deny them their equal opportunity to acquire knowledge of, and participate fully in the cultural heritage and way of life of the United States.

In addition we endanger our democratic institutions if we do not meet the increasing demand for broadly educated scientists, lawyers, educators, yes, even legislators, to deal with the increasingly complex problems of the social and physical world.

(4) The moral responsibility of the Government grows out of all of the above. It is our duty to see to it that the country is now secure and remains so and it is our duty to see to it that all talent is given the opportunity to develop through its own efforts in order that the country remains morally and physically strong and that our ideals do not become empty words.

I will now deal with the special value of the loan program provided for in my bill. It alone will not do the job. However, not only will a greater number of students receive specialized training if this Federal scholarship fund is created, but the better, more serious students will be attracted by such a program. If we provide this opportunity for loans, the industrious, serious, and highly motivated students will respond. Slackers and those not serious about the importance of an education will not undertake the obligations of repayment.

In this way we are assured that those mentally gifted students who are willing to exercise initiative and to work hard will have the opportunity to develop themselves and thereby make a high level contribution to society. A loan program is therefore an important complement to any scholarship grant program which you gentlemen may consider.

Let me now briefly deal with arguments which have been advanced in opposition to such a program. First of all there are those who contend that the loans will not be repaid. This cynical argument displaying an amazingly profound lack of faith in the youth of our country is not borne out by the facts. The record is as follows:

During World War II we had a temporary measure, the student war loan program, which lent $3\frac{1}{3}$ million in its 2 years of existence. As of December 31, 1957, approximately 80 percent of this sum has been repaid in addition to $375,695 in interest. Only 1.4 percent or $46,403.81 has been charged off and referred to the General Accounting Office.

In other words, the Government made a profit on this program.

An undetermined amount of this has even been collected. The Department of Health, Education, and Welfare anticipates that the major portion of the small outstanding balance will be collected.

The experience of private institutions is likewise very successful. The following is from an article which appeared in the New York World Telegram and Sun, May 5, 1956.

According to the director of admissions at Rensselaer Polytechnic Institute, "The experience of almost every college is that there is virtually no loss by default."

Thus, the record supports those who have faith in the integrity of the Nation's students.

The most foolish argument is that no one would take advantage of a loan program. I suppose I find this point peculiar because I just do not know anyone who withholds help from those who need it for fear it will not be accepted. This is too easy an escape from fulfilling an important responsibility. In addition, I am convinced from my

mail and the facts that a publicized Federal loan program would not go begging because it would be meeting a real need and one that will increase in the future.

Let me point out in conclusion that this bill will not place a burden on the Federal Treasury since it provides for a revolving loan fund. Furthermore, the issue of Federal control is not involved as the aid is to students with the administration of the program placed in the hands of State agencies.

Please understand that I do not say this bill is the panacea for education. It will not cure all problems. It will not give us all the specialists we need—not even those in any single field. But it is one instrumentality that will help the overall program.

Gentlemen, we can and must at this juncture in our Nation's history provide for the future, demonstrate an abiding faith in our youth, and discharge our moral and legislative responsibilities. I submit that the one thing we cannot afford at the present time is further postponement of enactment of this program.

Mr. Chairman, I appreciate this opportunity of appearing before your committee to present my views. Thank you.

Mr. ELLIOTT. Thank you, Mr. Multer. I have one comment with respect to your statement, and that is in the nature of a question. Do you think that the $5 million which you propose for the first year, and $10 million for the second year, and such sums as may be necessary for the years thereafter, are sufficient to get the program under way?

I am thinking of this against the backlog of something over 200,000 of the brightest students who do not go on to college each year.

Mr. MULTER. I am sure it will not solve the full problem, nor will it do as much as it should. Let us start it gradually. Let us see if it does have the popular acceptance that I think it will have.

Secondly, we can start off the first year with 5,000 students. If we double that the second year we can take care of 10,000. Let us see how many will avail themselves of the privilege. If the demand is far in excess of the amounts provided for, we can then in 1960 or even in 1959 as we see what the demand is for the program and how many students are availing themselves, then reassess the program. We may in 1960 say there is not enough demand for it. Let us abandon it. I doubt it. I think the demand is going to increase for the program.

This is not an expenditure. It is not going to cost us any money. From the experience we have had, every dollar of this money will come back. With the 1 percent interest it will pay all the administration costs and return the money and cover any possible losses.

Let us try it as a test program. We tested it, as I indicated, during World War II on a temporary basis. Let us try it again. After we have had a year or two of experience let us reassess the program.

Mr. ELLIOTT. The gentleman from New York.

Mr. WAINWRIGHT. I would like to congratulate my friend, Mr. Multer, on the program, and point out several things in his statement. First of all, he was a presputnik on education, which I think is quite relevant these days because so many of us—to a certain extent, myself—have only been fairly recently enlightened. I think that your program, which as you point out, you put in in 1955, was a proper start.

I am inclined to agree with you in your monetary value. On the other hand, there is another school of thought which must be given careful consideration.

The chairman has a comprehensive bill in. Title III of the chairman's bill provides a $40-million amount generally along these same lines as your bill. However, I am not clear on this. Does your bill specifically tie it into a scholastic qualification? In other words, is there eligibility, as there is in the chairman's bill, only to those who fit into certain requirements?

Mr. MULTER. Oh, yes. I leave it to the States to pick the students, but the States will have to set standards. It will not be merely applying for a loan because the boy or girl wants a loan to pay tuition. The boy or girl will have to show aptitude.

Mr. WAINWRIGHT. How about economic requirements? Will the applicant have to show that he is a needy case?

Mr. MULTER. Yes, the applicant should show that he is a needy case. He should not be required to show financial responsibility.

Mr. WAINWRIGHT. He would show that he did not have sufficient funds?

Mr. MULTER. Yes, he should show that if he did not get the loan, he could not carry on.

Mr. WAINWRIGHT. You were in Congress then. I did not know about this program that you referred to. Was it called the student war loan program?

Mr. MULTER. That was the title of it; yes, sir.

Mr. WAINWRIGHT. As of December 31, of this past year, there were 80 percent paid up?

Mr. MULTER. Yes.

Mr. WAINWRIGHT. Was this a 10-year program, do you know?

Mr. MULTER. Yes, I believe the program permitted a student to repay his loans over a period of 10 years. It did call for a higher interest. I think it called for 4 percent interest.

If you noticed the figures, I pointed out with a $46,000 chargeoff of loans as against $375,000 of interest, if we would divide that by 4 so as to reduce the interest rate, instead of 4 percent to 1 percent, you would still have $90,000 of interest collected in this period, and you have only had $46,000 in losses. It did cost more than $46,000 to administer the program.

Mr. WAINWRIGHT. Many of the proposals that have been presented to us tie in a loan program to the qualification of the student. That will mean that it will be necessary for this committee and for Congress to have some kind of legislation similar to that recommended by the administration where we can find out who are the bright ones and who are the dumb ones and separate the wheat from the chaff. Would you be inclined to support such a program?

Mr. MULTER. I would support that all-inclusive bill that the chairman has introduced. I have no pride of authorship. I am not asking this committee to report my bill. I am asking the committee to report a bill which will include this program. The grant program is important. All the items in the chairman's bill are important. All, together, will go a long way toward solving the whole problem. The loan program is only going to solve one part of it, a small part of it.

Mr. WAINWRIGHT. I have no further questions.

Mr. ELLIOTT. The gentleman from Minnesota.

Mr. WIER. I only have one curiosity to throw out. If this program was in effect during World War II—and I have no knowledge of it; as a matter of fact, of course, I was not here during those days—who sponsored this legislation, why was it sponsored, and why was it discontinued?

Mr. MULTER. I was not here in Congress when the bill was originally enacted. I came down in 1947 in a special election. This was already on the statute books at that time.

I believe the reason for initiating the program was because there was a tremendous need to channel more students into the colleges.

Mr. WIER. Was it initiated by the Department or by the committee or how did it come into being?

Mr. MULTER. I know that it had the administration's support, but whether the original idea came from the administration or from some Member of Congress or from outside educational forces, I do not remember. I know it did have the administration's support.

The surprising thing is that after it proved so successful on a temporary basis, we let it die.

It just so happened that nobody showed enough interest to revive the program or extend it.

Mr. WIER. I assumed from the résumé that you made that you had made a pretty close check on the legislation and that you had gotten in touch with the HEW for a history of the bill.

Mr. MULTER. I did not check on who sponsored it.

Mr. WIER. I mean the history of it.

Mr. MULTER. I did check and study the operation of the program to determine whether or not it was a successful program. It was successful. Students did apply for and get the aid and then kept their obligation and repaid.

I think you will find that most of the debts that were written off were because the student died rather than because he wanted to default.

Mr. WIER. Where did you get the information you have today?

Mr. MULTER. From the Department of Health, Education, and Welfare.

Mr. WIER. You did not ask them anything about the history of the bill?

Mr. MULTER. Nothing about the original sponsorship; no, sir.

Mr. WIER. Let me ask the chairman a question. You have had the Department here.

Mr. ELLIOTT. Yes, sir.

Mr. WIER. Has there been anything approached on a question of a trial run on this type of legislation, by the administraiton, or do they not know anything about it?

Mr. ELLIOTT. They have referred to it, I will say to the gentleman, just in passing, to the effect that this program was in existence during World War II. I believe, to be specific, that the witness, Dr. Flynt, referred to it. I think in the testimony that he gave originally here last August or thereabout, that you will find something about it in the printed volume of hearings.

Mr. WIER. I know where to look now.

Mr. ELLIOTT. The gentleman from New York, Mr. Gwinn.

Mr. GWINN. Mr. Multer, I was reading last night a little Greek history and you reminded me of the statement of Socrates which was to the effect that statesmen or politicians who concerned themselves only with the immediate demands of organized groups, used the power of government for temporary purposes, were only contributing to the destruction of the nation, whereas those who took a long look into the future and thought in terms of the future welfare were indeed great statesmen.

So you qualify as a great statesman if you had lived in Socrates' time.

Mr. MULTER. Thank you, sir.

Mr. GWINN. I wonder if you have got enough evidence to support the idea that the student today needs loan funds. I had a letter from the University of Virginia last week saying that they have, in that single university, $300,000 unused for lending to students.

Mr. MULTER. I am surprised to hear that, Mr. Gwinn. I think there has been a poll made of educators on the subject. I think they divide about equally between those who would favor grants and those who would favor loans.

I will say that if you take the total number that would favor both grants and loans, you find that a very large percentage of them favor the principle.

I assume that that takes in men who have had experience in colleges that is quite different from the one you referred to.

Mr. GWINN. There is another feature. I think we lack specific information about what the need is. The fact that only $3¾ million was applied for in World War II would indicate that the demand was not very great at any time, and the fact that it was discontinued after 2 years was further evidence that the demand for loans was not very great.

Mr. MULTER. Except, Mr. Gwinn, we must have in mind the war years and the temperament of the boys during the war years. There was much uncertainty of what their future was. Their desire was to get into the service and get the job done. I had that with my own boys. The older boy was then in an engineering school at Cornell, and his desire was to get in and get his service behind him and get the war behind him. Parents who had boys in colleges those days did not know whether those boys would go back or not when the war was over. Most of them, when they returned, went right on and did finish.

The temperament of the boys was very much different.

I think the encouraging thing is that they did use as much as they did during the war years for a loan program.

Having in mind that this is really going to cost us nothing except, possibly, the cost of administration of the program, and that will be very small, let us try it and see what happens.

Mr. GWINN. It gets the Federal Government into the business again that belongs to the individuals and to the local community. It seems to me you get to the point where it will raise the constitutional question once more. Is this a proper function of the Federal Government? It cannot be really called a defense measure or a military measure.

Mr. MULTER. It is a welfare measure. I think I know your philosophy on the matter. Let me put it this way, sir: Why should we not take this position? As long as we are going to continue to make loans, Federal loans to business, why should not we also make it to the youth of our Nation?

Mr. GWINN. Why, you can justify most anything on the loans that we are making, which is about one-fifth of all the lending that is done in the Nation today. That is the trouble. Most of those loans are partially bad. Many of them are wholly bad. We have the Government in business on a big scale. Of course, that, to me, is the reason why we should not certainly expand further this incredible Government that we have, and I am speaking of it under Republican auspices, because I think we are making respectable everything that Roosevelt and Truman did, emminently respectable. Why should we not, while we are trying to revamp our notions about what the functions of government are, try to stop this sort of business? Why do we not take a look at what it is that we have already bought with Federal dollars?

Mr. MULTER. I am the wrong one to ask that, Mr. Gwinn, because, as you probably know, I thought those were good programs under Roosevelt and Truman, and espoused them. I think they are good programs under Eisenhower. I think they are good programs, no matter what party is in control. That is why I think we ought to expand them.

If you disband our Small Business Administration, where are these small-business men going to get the loans? If you take away the Federal Reserve Board and its Federal Reserve banks, where will the big banks get their money? I say that is good business. It is not only good business; it is good for our country; it is good for our economy, and we could not get along without it.

If we agree with the material viewpoint that it is proper for government to help business, then it is proper for government to help these youngsters get an education. Maybe some of them will later come to this body as Congressmen and espouse your viewpoint rather than mine, but I am willing to run that risk.

Mr. GWINN. If they are beholden of the Government they will begin to worship the Government like they did in olden times.

Mr. MULTER. There, also, I do not agree. When you get to worshiping a government in a democracy, in a republican form of government like ours, it is self-worship, and we are not going to get to the point of worshiping ourselves. We are too individualistic for that.

Mr. GWINN. I wish I were as hopeful as you.

Mr. ELLIOTT. Thank you, very much, Mr. Multer. Your statement has been most helpful, and we appreciate your time and consideration.

Mr. MULTER. Thank you, Mr. Chairman.

Mr. ELLIOTT. Our next witness this morning is Mr. Devereux C. Josephs, of New York. In recent months, Mr. Josephs has completed his duties as Chairman of the President's Committee on Education Beyond the High Schools. Accompanying Mr. Joseph is Mr. Collins, executive assistant, New York Life Insurance Co. Mr. Collins formerly was Acting Executive Director of the President's Committee on Education Beyond the High School.

I am happy to welcome you, Mr. Josephs and Mr. Collins. We will here what you say very gladly and in any manner that you care to present it.

Mr. WAINWRIGHT. Mr. Chairman, before Mr. Josephs starts, I think the record should show that Mr. Josephs came down here, and posterity

will not know this, but, during one of the aftermaths of one of the worst snowstoms in history, he could not get on either plane or train yesterday afternoon, so he got on an evening plane to come down. I can testify to this, because I was with him. He has not had any sleep all day yesterday or today, in his effort to appear here on time today. I think the committee ought to make note of that and be appreciative.

Mr. JOSEPHS. Perhaps the record ought not to show this, but the Congressman said he was sorely tempted to stay in New York last night but he thought perhaps on the whole he would come down and hear what I had to say. I urged him strongly to stay in New York.

Mr. WAINWRIGHT. I think the record should not show that.

Mr. JOSEPHS. Mr. Chairman, perhaps if I made a brief statement here, and there are copies of it, then I suggest either that you ask questions as I go along or put questions to me when I have finished reading it.

Mr. ELLIOTT. Would you allow us to put questions as you go along?

Mr. JOSEPHS. Certainly. I am going to be reading from this, so I will not be upset at all.

STATEMENT OF DEVEREUX C. JOSEPHS, CHAIRMAN OF THE PRESIDENT'S COMMITTEE ON EDUCATION BEYOND THE HIGH SCHOOL AND CHAIRMAN OF THE BOARD, NEW YORK LIFE INSURANCE CO., ACCOMPANIED BY JACK COLLINS, FORMER ACTING EXECUTIVE DIRECTOR OF THE PRESIDENT'S COMMITTEE ON EDUCATION BEYOND THE HIGH SCHOOL AND EXECUTIVE ASSISTANT, NEW YORK LIFE INSURANCE CO.

Mr. JOSEPHS. My name is Devereux C. Josephs. I am chairman of the board of directors of the New York Life Insurance Co. Mr. Chairman, I think you and the committee for this opportunity to present my views on some of the critical problems we face in providing enough of the right kind of post-high-school education. They are the views of a layman—not an expert. From time to time, beyond my regular activities as a business executive, I have served on various public and private committees dealing with some problems of higher education. Most, if not all of my views, derive from these experiences.

The interim and second reports to the President of his Committee on Education Beyond the High School are the basis of my comments on the legislative proposals before these subcommittees. These reports emphasize a balanced approach to the problems of post-high-school education. I attribute the general unanimity of these reports to the efforts each member of the President's Committee exerted to achieve a middle ground. We found in examining the questions before us that it was necessary to achieve a balance between these opposite demands:

1. Our national tradition has emphasized that education is local in nature, but we are all aware that it is national, even international, in consequence.

2. We realized that education is an intensively selective process, and that human capacities to profit from it vary greatly. Yet, on the other hand, we were equally aware that our democratic system requires education be open to all who can profit from its bounty.

3. Recent evidence underscores that there is a tremendous need for certain kinds of education in depth, particularly scientific; yet we are well aware that a healthy society requires education in breadth as well.

One conclusion I drew from observing the process of balancing many factors is that we must proceed slowly and steadily to the goals we define. Certainly, one single stroke will not solve all our educational problems.

Mr. Chairman, I will, with your permission, now turn to commenting on the two principal bills pending before your committee. The first of these, H. R. 10278, implements the program recommended by the Department of Health, Education, and Welfare.

The other bill, H. R. 10381, is your bill, Mr. Chairman. After I have completed my comments on these bills, I would be happy to answer any questions the subcommittee members may have.

H. R. 10278: The bill, H. R. 10278, entitled the "Educational Development Act of 1958," is divided into five titles.

Title I, part A, would provide assistance to the States in the early discovery of student aptitude and assist them to develop these aptitudes during high school through improved guidance and counseling service.

I agree with this proposal. The President's Committee strongly recommended that steps be taken along these lines.

Mr. WAINWRIGHT. On that point, before you go any further, your committee recommended that steps be taken along these lines, but did you recommend that the Federal Government do it or that States do it?

Mr. JOSEPHS. The Federal Government makes appropriations to the States for that purpose.

Mr. WAINWRIGHT. I did not realize that. I believe in the printed report that was issued in July there was sort of a general recommendation to the effect that the Federal Government keep out of education beyond the high school. The impression I got was that the Federal Government stay out of the educational field in principle and leave it to the States and the local communities to handle it.

While I agree with you 100 percent on this, I just wondered whether there is a change or modification of this July report?

Mr. JOSEPHS. No. We did not in our report recommend a Federal grant for that purpose, but we made it very clear that this was something that had to be further developed and emphasized. I think that perhaps there was the implication that if Federal money was to be spent in this area, this would be a good place for it to go. It was not specifically stated.

Mr. GWINN. What page is that you are referring to, Mr. Wainwright?

Mr. WAINWRIGHT. It is at the bottom of page 21 of the second report to the President. Actually this was the main report. It was followed, I believe, by a letter report in December. This is the printed one. I have not looked at it for sometime. I want to make sure I am right.

Mr. JOSEPHS. Title I, part B, provides financial incentive to able students in the form of undergraduate scholarship assistance. Approximately 10,000 students would be assisted the first year of the program's operation and this would increase to 40,000 students in the

4-year period. This would require a first-year expenditure of $7,500,000 rising to a fourth-year expenditure of $30 million.

I agree in principle with this recommendation. I believe that this program should be regarded as an experiment in Federal undergraduate scholarships; not as a full-blown continuing program. The facts we have now do not support a need of a giant Federal scholarship effort at present.

If we regard this effort as experimental, we can gain knowledge that we badly need for future plans. It should also be noted that any scholarship program not providing a cost of education grant to the institution receiving the scholar puts a heavy burden on the institution (or the supporting taxpayers) that accepts him. I note in title IV concerned with graduate education, that there is such an institutional grant.

Title II, parts A and B, relate to science or mathematics instruction in public elementary or secondary schools.

Mr. Chairman, the President's Committe did not study problems of elementary or secondary schools. I am insufficiently familiar with the nature of the problem to offer specific comment.

Title III would authorize assistance in the expansion and improvement of the teaching of modern foreign languages through arrangement with institutions of higher education and would also establish institutes for advanced training of foreign-language teachers. Further, it provides assistance to institutions of higher education to establish centers for teaching rare languages.

Mr. Chairman, the President's Committee strongly emphasized teacher training as one part of improving the quality of the teaching profession. Although this title deals only with part of the problem, foreign language teacher training, I am in substantial agreement with it. I might also point out that many of the techniques developed in foreign-language instruction might well have a value in other teaching fields. I hope that proper steps be taken to apply some techniques relevant here to these other fields.

Title IV would provide assistance to institutions of higher education for the establishment of new programs of graduate education and for the expansion of existing programs including fellowships with a preference for individuals interested in teaching at institutions of higher education.

I strongly concur in this title. I would add in respect to the establishment of a National Advisory Committee on Graduate Education that full use be made of the experiences already gained in similar types of programs through the work of many foundations, particularly Ford, Rockefeller, and Carnegie. Their experience should be utilized here so that the funds appropriated for this work do not duplicate work already accomplished.

Title V would among other things, authorize grants to the States to improve and strengthen State educational statistical and informational programs.

While I concur strongly in the general principle of this recommendation, I feel that this does not go far enough toward the total objective of improving our national educational statistics and information.

I particularly see it needed for a mechanism to coordinate the Federal statistical agencies and utilizing their present capacities to

the fullest in the production of educational statistics and information. I will, when commenting on H. R. 10381, refer to this matter again, Mr. Chairman.

I am going to ask Mr. Collins to amplify it at that time or subsequent, if you so with.

In summary, Mr. Chairman, subject to my comments, I am in support of H. R. 10278.

H. R. 10381: I would like to turn now to H. R. 10381 and give you my views on this bill.

With respect to Title II—National Defense Scholarships.

I note that during the life of the program, a total of 240,000 students will receive scholarship grants. In addition, 20,000 additional scholarships will be granted to students already attending college. This would thrust this many more new students into the unready universities and colleges with consequent additional local costs to them. Expenditures notwithstanding, such a high input would not produce the results we all wish.

It could well impair the quality of education our young people now receive. I have already indicated my support for the undergraduate scholarship program outlined in H. R. 10278. I did so because I regard this as a necessary worthwhile pilot experiment. I point out, Mr. Chairman, that once a massive program of this type is undertaken there would be great difficulty halting it if proved unworkable. I am suggesting, therefore, a more moderate approach until we are sure of our ground.

Title III: National defense student loan program, provides for a federally sponsored loan program which enables the "Commissioner to make loans to persons selected by State Commissioners * * *."

Although the President's Committee is on record in support of loan assistance, I believe this is an area in which private capital can operate with the greatest effect; it is a field which the Federal Government should not enter. I think we must give strong encouragement to programs such as the HELP program in Massachusetts, the New York State plan and other plans. Let us hope that there will be satisfactory fruition of plans now under consideration by private philanthropy.

Title IV: Work-study program provides that the Commissioner can make grants to institutions of higher education to provide work-study assistance. This program is to be operated on a 50–50 matching basis with the institutions involved.

The President's Committee is on record in support of such a program, and this title fully implements its recommendation.

At this point, Mr. Chairman, I call your attention to the fact that these provisions for student assistance, scholarships, loans, and work-study programs are not an integrated whole. I feel that any rounded program of student assistance must make it possible for the student to get, in appropriate measure, assistance from any combination of these three factors. He should, for example, receive so much in scholarship assistance, a loan of so much, and whatever work-study support he needs. Without such a provision, something similar to the principle of Gresham's law will operate. Soft money drives away hard money; gift of scholarships takes away the appetite for loans.

Title V, part A, relates to assistance to State educational agencies.

This is a matter not discussed by the President's Committee; and again, Mr. Chairman, I am not able to comment on it.

Title V, part B, provides assistance to institutions of higher education for the purpose of carrying out programs for the acquisition of science-teaching facilities.

The President's Committee did not devote particular attention to programs devoted to science-teaching facilities. The President's Committee did support, however, a recommendation for a Federal grant-in-aid program similar to the Hill-Burton Act to assist nonprofit higher educational institutions in constructing non-income-producing facilities. The President's Committee's recommendation is much broader than that contained in this title. I support that recommendatian and this recommendation as far as it goes. I see no reason to confine a program to simply science-teaching facilities.

Mr. ELLIOTT. Let me interrupt you right there, Mr. Josephs. Would you put a limitation on such a title whatsoever? I limited this to science-teaching facilities. You say you would go further, as did the report of the President's Committee.

Mr. JOSEPHS. That is right.

When it comes to the drafting, certainly it should be for instructional buildings where instruction would be carried on. It would be for laboratories. It would be perhaps for development of libraries. It certainly would be closely associated with instruction.

Mr. ELLIOTT. Laboratories, science buildings, and library buildings you think might be covered?

Mr. JOSEPHS. Yes; I think so.

Mr. ELLIOTT. Of course, those are two of the very fundamental elements of college education, and they are so recognized by all of the accreditation boards about the country. I am wondering if the suggestion you have made in that behalf is not a very good one.

Mr. JOSEPHS. We thought it was because at the moment the colleges are able to borrow money for income-producing facilities. That can be for student unions, dining halls, residences. Those are the main areas. But there is no way in which they can get assistance in order that they might build classrooms, libraries, laboratories, and so forth. Of course the laboratories might come in under the scientific purposes as was contemplated in your bill.

Mr. ELLIOTT. Would you expand this title to include the ordinary classroom, Mr. Josephs, for the teaching of the basic arts and science subjects, we will say?

Mr. JOSEPHS. Oh, yes, most certainly; because to my mind, and our report says this again and again, we think too great an emphasis on science is a bad thing, that it puts unusual pressure at a point where it is not wholly desirable. A broad general education is the best foundation, and then let the specialization be built.

Mr. ELLIOTT. In your recommendation do you carry the thought to the extent that it would cover, we will say, auditoria?

Mr. JOSEPHS. I suppose auditoria might be income producing. That is always the hope in the colleges. We did not specifically mention that. We said in our report—such as classrooms, laboratories, libraries, and administrative buildings.

Perhaps auditoria could be in. Your original question was, should it be limited? Yes, I believe it should because in all the recommenda-

tions that we make in my own personal view, I feel very strongly that we should experiment, that the programs should be pilot ones; we try them out and not go too far.

Therefore, I would like to see a limitation on this and, if it works well, then would be the time to add the auditoria or various other activities which might or might not make a return.

Mr. ELLIOTT. Of course, stadiums presumably would yield a very good return if the college had a very good football team.

Mr. JOSEPHS. I was going to say it was wholly a function of the halfback.

Title VI provides summer school or extension training courses for teachers. This, Mr. Chairman, is a matter outside my purview.

Title VII: National defense fellowships provide initially 1,000 fellowships for college- and university-level teachers for study in fields consistent with the national interest.

I agree in principle with this recommendation as I did with the proposal contained in title IV of H. R. 10278. I would like to point out, however, that title IV of H. R. 10278 provides for an institutional grant; this title does not. I think it is most important, Mr. Chairman, that this kind of provision be included.

Mr. WAINWRIGHT. Would you amplify on that? Is it because you are placing a burden on an institution?

Mr. JOSEPHS. Graduate schools are a very expensive business. The undergraduate college, particularly the private one, for example, draws a good deal of support of a somewhat warm emotional nature from the graduate. But when you get to the graduate school it is expensive to maintain.

Those who are in a graduate school do not tend to support it for sentimental reasons at a later date. The graduate school does its work for the whole of the Nation. It is the point where research is done, where teachers are created. As such, it is much wider than the constituency of a college. Such has been the explosion of knowledge, that the universities and our graduate schools are rapidly outgrowing the traditional support which they have had.

This is true of all of the universities, both the public and the private. The various graduate schools such as medicine and law and science require equipment, very good teachers, a very careful curriculum, and it is pretty expensive.

Title VIII: Guidance and counseling, parts A and B, refers to State support of guidance and counseling programs and institutions of guidance and counseling. I concur with this title in principle.

Title IX relates to State secondary schools. I have no comment to offer on this title.

Title X, part A, relates to research and experimentation or more effective utilization of television, radio, motion pictures and the related media for education purposes. I strongly concur in this recommendation. I feel that this is a necessary part of increased services that the Office of Education should properly offer.

Part B, relates to the acquisition and development of materials in connection with the proposal in part A above. Again, I concur in this part.

Part C refers to the establishment of an Advisory Council on Education Media. I concur in this part.

Mr. WAINWRIGHT. Would you expand a little bit on that, why you feel personally interested in it?

Mr. JOSEPHS. There is a great deal of experimenting going on now and there is very little interchange of information. It is awfully hard to get it around from one place to another. So there are two things that are needed. One, perhaps, the money to do the experimenting. For most colleges, budgets are so tight that there is not much risk money around for experimenting and the second thing is that when one develops a pretty good idea, he has about exhausted his money and cannot pass the word along to others or no attention is paid to it.

To have a central clearing house for that, it seems to me, is a very desirable thing. We have a lot of new scientific aids which we have been using in other activities in our business, commercial activities, and I am sure that some of them will eventually find their place in education.

Education is very conservative. They do not change very fast.

Mr. WAINWRIGHT. I thought, Mr. Josephs—and I do not know; I am trying to find out about this—that was one of the things that HEW was supposed to do anyway, pick up these new methods and techniques and in turn, feed them back and disseminate them to the teaching fraternity.

Mr. JOSEPHS. Could I ask Mr. Collins to expand on this, because he has had very close dealings with them on just this very subject.

Mr. COLLINS. Mr. Chairman, what Mr. Wainwright has said is absolutely true. This recommendation in part of this title and the other, the strengthening of statistical services, is likely to be the area that I feel is the most important, where a Federal contribution can be made.

In the course of the President's Committee, as you know, we had five conferences throughout the Nation with educators and people interested in education. The constant theme was that they do not know enough about what is going on in other areas to put it to use. As one example, when we concluded the work of the President's Committee we had $15,000 to devote to a project we called a casebook project.

This was nothing more than taking experiments in education, reducing them to about two pages and circulating them to other education institutions. We had a surprisingly fine result from that. People wrote into the Office of Education and said, "This is the kind of thing we wanted to know, what other educators were doing; how they were solving their problems."

Surprisingly a great number of these letters came from legislators, particularly State legislators, saying they were glad to hear of this going on in other States so they could put it in their own plant. There is, in my view, a very poor circulation of educational information.

This leads to another point. It was the view of the staff that the Office of Education was seriously handicapped in terms of their finance to produce this kind of job. They had excellent staff people, but their program was much too small to them, small comparing it to the Bureau of Census, the Bureau of Labor Statistics.

There simply was not the kind of support that would disseminate the information we already have. This is the Office of Education's proper function.

Mr. WAINWRIGHT. Did you run across any type of work done by a foundation, such as Ford or Carnegie, or Common-Wealth Fund, or similar to those, who had taken something like this on as a project to compile new data and new methods and disseminate them?

Mr. COLLINS. As you are aware, one of the foundations made a grant to the American Council to improve their statistical service. I recall it was in the neighborhood of a $300,000 grant to develop this very thing. Their complaint was in order to prepare studies they did not have enough information.

In reading the President's report, we have commented on this in several places. It was particularly true on adult education where information simply does not exist. The point I think that underscores this whole thing, Mr. Chairman, is that in making educational plans we will never have all the information, but we ought to have a lot more than we have now and while this is true at the national level, it is most certainly true at the local level.

Mr. WAINWRIGHT. How far would you extend your source as to curricula, methods, classroom data? What type of interchangeability?

Mr. COLLINS. As this title X suggests, and this is the type of information, one type, they need, the other they need on administrative cost, which you would call statistics relating to the area of administrative management of educational institutions.

For example, if you want to find out what the average teachers' salaries are now in any point in time, every institution has to make its own survey in order to make comparable salary data.

Mr. WAINWRIGHT. Are there not a class of institutions that set the pattern? In the law business in New York, you can say White and Case pay such and such and they follow that.

Mr. COLLINS. That is true, but when you want to make this kind of case you have to go out and explore for yourself. Many colleges do not have this kind of facility that will enable them to do this. In H. R. 10278 that is a correct approach. They are first going to strenghten the State educational statistical apparatus or agency.

The type of information cannot flow back because it does not exist in the States and this is the correct place to start, but much more has to be done in this. Part of the chairman's bill, these two parts Mr. Josephs is commenting on, is certainly one important aspect, but in discussing scholarships, facilities, and teachers' salaries this is a subject that is likely to fall between the chairs if it is not brought out and amplified more.

For a small expenditure of money, we can get a tremendous amount of planning data we do not now have.

Mr. JOSEPHS. We found ourselves very much handicapped in our work because there was no information or very little information available. When we finally filed our report, you will not find in it, except in the economic area, but in the area of educational statistics you will not find anything later than 1954 because there was no information available and even the 1954 information we got before it went to press.

Mr. ELLIOTT. Let me interrupt there, Mr. Josephs, to ask Mr. Collins a question.

As I get the impression from what you have said, the Office of Education is deficient in two aspects: (1) It does not have the money, enough money to make these studies in the field of, you pointed out,

school administration and other fields; and (2) it does not have the money to disseminate such information as it does have and that that may be up to date and quite useful. Is that correct?

Mr. COLLINS. That is correct.

Mr. ELLIOTT. Mr. Josephs pointed out that some of the information that you have badly needed was only current to 1954. Now, do you recall how much money of the Office of Education expends in this field or in these two fields I have mentioned, now, at about what rate, Mr. Collins?

I do not know, myself.

Mr. COLLINS. Mr. Chairman, I tried to find that out but the Office of Education, as I understand, does not budget for information and statistics as a discrete budget item. That item is in the secondary and elementary division. It is spread out throughout their budget, not in one item.

I would like to say that it was our opinion, after reviewing what they were doing with what they have, they were doing a splendid job. I was surprised that we had as much information as we did have out of their work. I think it was highly professional and a first class job, Mr. Chairman.

Mr. GWINN. The enactment, I think, in 1868 set up the United States Office of Education for the very purpose of collecting these statistics that you speak of and disseminating them. That was their job. They issued reports regularly for many, many years. Then they got to falling behind.

The larger they grew, the more money Congress appropriated, it seems that they failed to get their statistical work out. They were a year or more behind, so that their work was not useful to the schools. They had to get it some place else. I cannot understand this cry of lack of money. I think there is some other reason back of this.

They are much more interested in what is being taught; they certainly have had a great part to play in the advancement of our progressive educational system, holding meetings and conferences and all sorts of things on the content and the methodology in education.

That office, like any Government office, is human. You found it so, did you not? We all do.

Mr. COLLINS. That is correct, sir.

Mr. GWINN. They have their theories of what education should be, naturally. That is why I dread to build up these bureaucracies. I would not be at all surprised if you find a group in the United States Office of Education that is against television.

What kind of statistics are we going to get out of a political office that represents may be a million school teachers who are not too keen about the prospects of television? I am skeptical about this being a center of information.

Mr. JOSEPHS. I do not know what their attitude is, for example, on the question of television or almost any other subject. We do not have as much information about education available to us as the businessman or the farmer has in his field. Maybe if the information is biased, isn't it better to start collecting the information than not to have any, on the fear that it might be biased?

For that reason, it would seem to me that this is a thing worth doing. They are no more human or any less human than those in other departments.

Mr. GWINN. You would think if they were doing anything at all in the way of collecting and disseminating it, they would be doing it about television; would you not?

Mr. COLLINS. Mr. Chairman, they are doing, in my judgment, what they can do with what they have. I did not detect any bias in these statistics, any more than any other Government statistics. I mean it is very difficult, as you know, to detect bias in statistics.

Secondly, the problem, the need for planning material has grown a great deal since the Office of Education was organized. They are supporting their statistical operation pretty much as at the time it was organized. I am not an educator and did not get into the mysteries of progressive education. That was not our field.

They tried to get seriously, every bit of information they wanted. The mechanics for collecting them in terms of the kind—for example, they do not have in the Office of Education nearly the same amount of equipment that other Federal statistics agencies have for collecting information.

Mr. WAINWRIGHT. You mean like IBM machines and so forth?

Mr. COLLINS. That is right. That is one reason for Mr. Josephs' comment that in order to help the Office of Education there should be a closer coordination between other Federal statistical agencies that do have this. Still, this does not complete the problem; simply saying we should do more in coordination does not do it.

They have to develop a statistical and information program to carry out their responsibility, as the gentleman from New York points out.

Mr. GWINN. In industry, we have these industrial associations, fairs, conferences and ventures, which seem to be the best source of information. I should imagine that in television, for example, the convention showing the experiment going on in Hagerstown or Pittsburgh, or Boston, would be the best source possibly, of information on the subject of what is doing in television.

Maybe we need to apply in Government somewhat the same kind of thing we apply in business. We get our information from the trade or association source. Do you have any idea about that?

Mr. JOSEPHS. Could I answer that? Let me speak from the experience of my own company, the New York Life Insurance Co., and some companies of which I am director. We rely very heavily on the statistical information that the Department of Commerce gives us. We would feel that we were unable to go about our jobs properly unless we had that information and had it up to date. So that we need it; we rely on it, and I would presume that the farmer has the same attitude.

Mr. GWINN. Maybe there is a difference, Mr. Chairman, in this education business. The Commerce Department does not attempt to run your business or have any ideas about how to carry on the life-insurance business, I imagine. But somehow or other, this educational center down here keeps coming up before this committee with ideas about what the Government should do in education and has a lot of statistics about why the Government should be in education, for example.

It becomes an advocate in a very different way from the United States Department of Commerce, I should imagine.

Mr. JOSEPHS. Well, they were very kind toward us because they did not subject us to any influence at all during the year and a half that we were their tenants.

Mr. GWINN. I feel they must have had some influence, because you are, it seems to me, rather uncertain about how far you think the Federal Government should go in many directions, and I do not see any fundamental principle underlying your statement which would help us to determine what function the Federal Government has in education, if any.

We know it has a function in defense and in the military, that is its primary function, defense, and scholarship could be justified on that score. But I do not see how you justify a lot of these other programs in terms of the fundamental function of Central Government.

Mr. JOSEPHS. Well, the Government has been spending about a billion dollars a year in education. It has been doing it for a very long period of time.

Mr. GWINN. That is primarily on the defense side of government.

Mr. JOSEPHS. No, the land grant colleges which were established in the 1860's, had an enormous influence. They gave money for agriculture and mechanical arts and such that the whole system, not all of the State universities, but many of them, were developed as a result of that.

That was money that came from the Federal Government beginning then and has continued now. Of course, there are in other areas a great deal for the military, but some for the training of Government experts in other fields.

Mr. GWINN. You still have the question of what is the function of Government, whatever they did, in giving the land in the beginning. The colleges developed like they gave land to individual citizens, to get the land parcelled up, but we are not operating with the present-day influence on those very colleges you are speaking of, are we?

We are not following up these universities by appropriation or controls of any kind?

Mr. JOSEPHS. We have in our report the list of the annual payments by the Federal Government to the colleges and the universities and I think it comes to about $875 million a year.

Mr. GWINN. Where does the Federal Government get that money from, generally?

Mr. JOSEPHS. It gets it from the taxpayer.

Mr. GWINN. Does that come out of general appropriations?

Mr. JOSEPHS. No; they are various appropriations. There is vocational rehabilitation, education and training of veterans—that is the GI bill, the Korean bill, Air Force ROTC program——

Mr. GWINN. I understand that. That is what I was saying, that is justified.

Mr. JOSEPHS. The international educational exchange program, Department of State, research fellowships, National Institutes of Health, National Institutes of Mental Health training grants, the National Science Foundation fellowships, and so on. Eight hundred and eighteen million dollars is the bill.

Mr. GWINN. I think you will find that is virtually all on the defense program. That is proper function of Government to build up defense. I think you get much further than that in these programs.

Mr. JOSEPHS. This is bound to be a difference of opinion in regard to the function of Government, the Federal Government, in regard to education. The concept that it is wholly a local measure is one which I think we originally began with.

I am not sure, in my own opinion I do not believe, that it is one that we can wholly continue with. Education does not stay within the State or locality. It flows outside. There is interestate commerce in education. I think it is an inevitable consequence of the more and more complicated society we have, that there be a certain amount, beginning perhaps with centralized recordkeeping and matters of that sort, that the Federal Government enters in and from then on perhaps it does more.

Certainly, the quality of education of this country is a national concern, not a local concern, and if one area of the country is less educated and does not keep up with the rest of the country, why it is a matter of national concern.

Mr. GWINN. Of course it is a matter of national concern that we raise corn. Do you think it is a function of the Federal Government to carry your money, Massachusetts money, out of those rich, black-land farmers in Illinois, to pay them for raising corn?

Mr. JOSEPHS. I have never done any farming. I am afraid I must admit to a prejudice in that area.

Mr. GWINN. I know, but we have to have a principle in this field, it seems to me a theory on which the Federal Government operates.

Mr. MCGOVERN. Some of those farmers are not as rich now as they once were, Mr. Gwinn.

Mr. JOSEPHS. I think in the area of education, just as we have done in many other things, there is not a clear-cut black or white way, but that we operate as a combination and a very successful one in this country, a combination of both having the Government assist and being independent. We have had our private educational system and our State supported one that have lived side by side.

Now, we have one principle of free education and another one of only education that you pay for. Those represent compromise and in my opinion there are certain things that the Federal Government not only should do, but it is the most effective way of accomplishing certain results.

Mr. GWINN. That is what I was trying to get at. What is it that the Federal Government should do? I gather you think they should get together to make a commission study and a few of us think it should do one thing and some another and we compromise and it does almost anything and all things before we get through.

Mr. JOSEPHS. Well, I do not think that has been the history to date. Many bills are proposed, but not all of them are passed. There is a gradual change of procedures that come from the acts of Congress. We slowly modify our system of government to the society that we are living in and it changes.

Mr. GWINN. Do you believe today strongly in the constitutional concept of limited functions of government?

Mr. JOSEPHS. I do not think I am equipped to get into a debate with you, Mr. Congressman. I do not think that that is an area which I have thought enough about or that I can speak well enough on to make my point clear.

I have this, though: I believe that as our society becomes more complicated, there are certain things that are the responsibility of no one of us and maybe in no one locality that must be shouldered eventually by the Government. I have always assumed that the Constitution was such a document, that allowed for that type of development, for that is surely the way we are developing.

Mr. GWINN. I was looking for a statement of principle I do not get. Will you illustrate your statement now, that because we get complicated the Government should do something? Why should Government do anything but defend our rights and protect our individual liberties at any point?

Mr. JOSEPHS. Well, we have, I think, six commissions that I heard about recently here in Washington, that are charged with regulation of the air and communications.

Mr. GWINN. That is the police function. That is corrective, of course. That is a defensive function because they do not want one airplane to follow in the same pattern as the other.

Mr. JOSEPHS. I meant also the Federal Communications Commission and others.

Mr. GWINN. That is a police function. Here we are talking about appropriation for education, corn, power, and all the rest. That is the reason I brought up the question, to see if we really have anybody left in this country that believes in a limited concept or can we go into anything that our best minds think we should go into.

Mr. WAINWRIGHT. I think that Mr. Josephs is a moderate and he actually has given, I think, a very forthright and dignified and appropriate statement of a moderate in the field of education and constitutional government.

He is neither an extremist to the left, nor is he a conservative as some of you visualize conservatism.

Mr. JOSEPHS. Could I read something from the conclusion in our report in which we state:

> That the Federal Government should provide broad, national leadership, should collect and provide useful data and service and should provide certain other needed assistance such as is recommended in this report, but it should do these things only by methods which strengthen State and local effort and responsibility and in the case of direct financial assistance, only through programs which are periodicaly reviewed and which are promptly terminated when no longer clearly justifiable.
>
> And finally, the Federal Government should studiously avoid programs and policies which carry the threat of control or of other adverse effects upon educational institutions.

Mr. GWINN. What page is that, Mr. Josephs?

Mr. JOSEPHS. Page 106.

Mr. GWINN. Of the first or second report?

Mr. JOSEPHS. The second report.

We also spoke there of the processes we observed by which Federal policy was made, that it was not, as nearly as we could see, made by a single bill or by a single determination of principle, but by a gradual change. We had this to say:

> In almost all areas of national affairs Federal policy rarely has been created by a single piece of legislation or at a particular moment of time. It grows over an extended period from diverse origins, this modified by subsequent legislation and administrative decision and by the impact of the contemporary experience and events.

That is the principle, the background, upon which I have been endeavoring to explain my position on these particular items.

Mr. ELLIOTT. You may continue with your statement.

Mr. JOSEPHS. Title XI—Congressional Citations for Outstanding Scholastic Achievement.

Mr. Chairman, this is a matter which was not discussed in our committee and I do not have any firm opinion at this time.

Title XII relates to assisting States in providing vocational education of less than college grade in essential occupations.

Although the President's Committee supported this kind of education, that is, technical and vocational education after high school outside of colleges and universities, I do not know enough of the details of the implementation to discuss it at length.

Title XIII, section 1302, provides for the establishment of a National Advisory Council on Science and Education.

In principle, this section is consistent with the recommendation of the President's Committee. I do, however, raise one question: Is it possible that education will not receive full and proper attention when a single committee is concerned with both science and education?

I do suggest that these are inconsistent, but to give education the stature it deserves, I would prefer that there be a National Advisory Council on Education.

Mr. Chairman, that concludes my comments on specific portions of H. R. 10278 and H. R. 10381. I would be happy to try to answer any questions you or your colleagues may have at this time.

Mr. ELLIOTT. The gentleman from South Dakota.

Mr. MCGOVERN. Mr. Josephs, I listened to your statement with great interest and appreciation just as I did to the report of your committee some months ago.

I notice on page 6 with reference to the chairman's bill, Mr. Elliot's bill, you describe this as a massive program. In view of the fact that under the terms of the chairman's bill we would only be providing scholarship for about 40,000 students a year out of a college population of somewhere between 3 million and maybe 5 or 6 million, is it really correct to talk about this as a massive program?

Mr. JOSEPHS. Well, I suppose massive is relative. It is larger than we thought of or I personally thought of. It is larger than would be needed for a pilot program. My view is that we ought to start with an experimental program, first, and perhaps the use of the word "massive" is too strong. It is a relative word.

Mr. MCGOVERN. Is it your thought that even a comparatively small program would have an indirect benefit in at least signaling to educators and students and citizens all over the country that the Federal Government thinks education is important and that good scholarship is important?

Mr. JOSEPHS. Well, I think there are a lot of signals that are being sent out throughout the country now, in regard to the interest of the Congress in education, the number of bills, the discussion, the trip that the chairman took around the country and eliciting discussion, those are all matters that show that the Congress is interested.

Now as far as I am concerned, I am not sure how good a Federal scholarship program can be. There must be tests in the States. What sort of tests will they be? How well will they be done? What

are the problems of the means? How many people would have gone to college anyway? How many people might borrow the money to go to college, in what is really an American traditional style?

They borrow their money for many things of far less value, why not for a college eduction? I am not convinced yet that we need a Federal scholarship on those things. There is a big segment of people in the field of education that believes there should be very large Federal scholarships, much larger than the ones which the chairman has proposed.

I am not convinced of that yet.

Mr. McGovern. Do I understand you correctly, Mr. Josephs, to state your own view that if we have any kind of Federal scholarship program that it should not be limited or even weighted on the side of science or any other particular discipline, that the student ought to be completely free to select his own area of study?

Mr. Josephs. Absolutely, I feel certain of that. The scientists will emerge, the ones that are going to be good scientists will tend to develop from it. I do not believe you can make scientists in a pressure cooker.

Mr. McGovern. I agree with you on that. I just wanted to bring out that point. Was it your feeling in traveling around the country on your committee work that from the standpoint of public opinion it might be easier to convince the American people of the scholarship program geared to general education?

Mr. Josephs. No, not a bit. People were talking in two different ways. There were some who I believe had not very deeply thought about it and were quite worried, but the majority we saw said that it shold be as broadly based as possible.

Our report, of course, came out before sputnik came up. We pointed out the need for emphasis on science and physics, but I have a feeling that the better teaching of science and physics and mathematics is probably the best solution, and not in forced draft.

Mr. McGovern. I have no further questions, Mr. Chairman.

Mr. Elliott. Did I understand you to say, Mr. Josephs, that you are not convinced that we need a scholarship program of any kind?

Mr. Josephs. A Federal scholarship program.

Mr. Elliott. But that you are, as I get from your statement, quite willing that we attempt on a small scale a pilot program?

Mr. Josephs. That is correct.

Mr. Elliott. Then, to assess and see if it does have the value that some of us think it has?

Mr. Josephs. Yes, sir.

Mr. Elliott. And for that reason you would support the President's proposal or the Department of HEW's proposal of 10,000 scholarships?

Mr. Josephs. Yes, sir.

Mr. Elliott. Now, this thing keeps going through my mind, Mr. Josephs, in connection with that. We have about 27,000 high schools in this country and it seems to me that if this program is to mean anything much, that certainly those scholarships ought to be, at least one of them, within the range of every high school in the country.

Now, I know large numbers of people are eligible to go to college and large numbers that are not now going. I am thoroughly convinced

that the great contribution that this program is going to make is the inspirational pull out of the general educational system.

If these scholarships are so terribly few that the fellow out here in the ordinary high school never has a chance any more than to just hear one or read about one in the newspaper, then it seems to me it is not going to have that inspirational effect, certainly, that we look for this program to have.

Mr. JOSEPHS. That is a very cogent argument because we found out, or we tried to identify the reasons why the bright youngsters did not go to college. For some it was the lack of money, but for some they had not thought about it. They did not realize there might be some local scholarship money available.

So that the dramatization does have a value, but I would think there might be less expensive ways of dramatizing than by actually putting the money on the line.

Mr. WAINWRIGHT. One of the things that the chairman brings out, of the 27,000 high schools he is talking about, 5,000 high schools produce 82 percent of the college students. So you have 22,000 high schools that he is talking about where you have just a dribble coming in.

What he is trying to do is to stimulate interest in these high schools. On the other hand, as the commandant at West Point pointed out, very often the students coming from the 22,000 high schools do not have the intellectual capacity to fulfill the requirements that are going to be necessary under the scholarship program.

Mr. JOSEPHS. There is an optimum size for a high school and many were established at a time and built before the automobiles were generally available and roads generally available.

The result was that small high schools were established at below the size which could afford to really have first-class instruction and first-class facilities. A lot of those 22,000 high schools probably should be consolidated.

There is a study going forward now which I have great hopes for, that James B. Conant is doing, on the subject of the high school. He is a very able educator and he is very much concerned with it and high schools have never had an ex-president of a university, an ex-ambassador, come around to them at 8 in the morning and talk to the teacher and students.

He is doing this and he will spend 2 years on it. He is already beginning to get some pretty good information. This was outside the area of our committee for we were posthigh school. But posthigh school are the children, are those in high school and this is an area which has been left alone locally, and in some areas it is good and in some it is bad.

Now, he is beginning to identify those areas in which there is no thought much of going to college. You have pretty bright boys but there is no college tradition. Now how you get them to go on, I don't know. Perhaps the very large scholarship program would be one way to do it. There may be other ways, but I am sure that 27,000 high schools are too many.

Mr. ELLIOTT. Now, my second question is this: First, I want to preface it a bit. We have barely scratched the surface of looking into

loan programs. There are many loan programs available throughout the country, but those programs are all too often so restricted and limited that they are of practically no value.

Now, I can think of nothing that a sophomore in college needs less than he needs a $200 loan to be repaid in one year.

Mr. JOSEPHS. That is right. They are categorized by the donor.

Mr. ELLIOTT. We have so many of these loan programs and I am hoping we are going to be able to find out the exact number and get it in better shape than it is now insofar as the knowledge I have of it is concerned. I believe that probably half the loan funds available today are almost unusable, maybe more.

Now, the University of Minnesota has a pretty good program. They have a long repayment period. They are lending $300,000 a year and they need much more money. Their loan man testified. Their repayment rate has been first rate. It has been the same as has been the repayment rate of the First National Bank of the city wherein the university is located.

The point you make is that that should be handled locally.

Mr. JOSEPHS. There are two types of loans. I think this is not always clearly understood. There are the loans that are needed by the people of moderate and middle income or upper-middle income who have had the misfortune to have 3 children born within 5 years.

They need some financing, but they are people who have credit, but for reasons which are not very clear to me the American family will not borrow for an education for their children. If they cannot get it in scholarship, they do not like to borrow. They will borrow for an automobile, for a refrigerator, or a trip to Europe, but they won't borrow for an education.

Now, that is one type of loan. The other type is the loaning to the people who have no credit, or who are going into the type of profession which does not earn enough money to assure the rapid repayment such as the teaching or the ministry, to give two, and research, of various varieties.

Now, there you have a great variation of need and of type. What I fear about the Federal loan or even the State loan is that it sets too rigid standards and I have a feeling that whatever could be done could be done best at the university or the college itself, and let them make the arrangements with the borrower where there is a sentimental relationship and the feeling toward your alma mater is perhaps the best guaranty for repayment.

Mr. ELLIOTT. Thirdly, my bill has, as you have recognized, a work-study title. I, personally, feel that the loan title and the work-study title are in accord with some of the best of our American traditions, namely, the idea of self-help.

Mr. JOSEPHS. Yes.

Mr. ELLIOTT. Not many people who have testified about this bill to date have supported the work-study provision with any great degree of enthusiasm. I note that you observed that there is not enough coordination between the three approaches and I call your attention to page 71 of my bill, section 1308, which at least makes some little ap-

proach in that direction under a title styled, "Limitation of Benefits," wherein it is provided:

> The aggregate of the amounts which a student may receive under a national defense scholarship awarded pursuant to title II, a national defense student loan granted pursuant to title III and under a work-study program pursuant to title IV, may not exceed $2,000 for any academic year.

I think that maybe that is a step toward what you are talking about and as I envision my bill, I have in mind that it might be possible for a youngster to get some grants, some loan, and do some work-study all in the same year, and thereby keep his education costs within some bound.

Now, I hardly see how you can do that though, unless you provide for it in such a bill as we have. If you leave the loan to the system that is in effect now, then certainly you have very little coordination, it would seem to me.

Mr. JOSEPHS. I am hopeful that private philanthropy may pick up the tab here. There have been a good many conversations going on in the last 6 months and I think it might be awaiting some crystallization. That would be useful and it would be pretty much on the basis of the individual or the student borrowing the money and repaying it, at pretty good interest rates but perhaps with some alleviation that comes from philanthropic capital that goes in there.

I do not want to prophesy but I have a suspicion that this may be a very big thing in the future. Loans to date have been for the use of the very poor. I have a feeling that loaning for college education is going to be used by the middle income to a very large extent.

Mr. WAINWRIGHT. You, yourself, just said there was apparently, and also unexplainable to me, reticence on the part of the middle class to go ahead and borrow in this field.

Mr. JOSEPHS. It used to be for an automobile that a person was supposed to be a spendthrift that used his automobile before he paid for it. Now, 80 percent of the buyers of cars buy on time. Even the youngsters now buy their babies on time. They pay the doctor on an installment basis.

It is developing this way; it did not use to be that way. Why not for education? My general view is that if we can do this, ourselves, as a private plan, let us not get the Government into it until it is discovered that it is the only solution.

Mr. WAINWRIGHT. There will have to be a sort of change in the mores of the banking fraternity, particularly in small areas that the chairman is interested in, where the president of the national bank is willing to loan Mr. Jones $1,500 for this year on a note to send his children to school.

Mr. JOSEPHS. Suppose the college is the one that does the loaning and rediscounts the paper and then use the affection of the graduate and, let us say, the persuasion of the alumni association to collect the money?

Mr. WAINWRIGHT. Did you find in your discussion with the college fraternity that they were showing, particularly the treasurer and bursars and so on, that they were showing more of an interest in this type of proposition?

Mr. JOSEPHS. They are showing a great reluctance to put their names on the paper, but I think it is going to be unavoidable.

Mr. ELLIOTT. You mean as an endorsement to the bank?

Mr. JOSEPHS. Either that or to deposit the note and agree to keep its good notes in there. That is a way in which you do not put your name on the paper. You simply agree always to keep a live note and then it stays off your balance sheet.

Mr. WAINWRIGHT. I am sorry, but I did bring up your report, and it mentioned that. I was referring to the bottom of page 19. I will read the sentence, actually. You were talking about need for assistance to students, which is on the chairman's point and, also, I think, generally in the field of scholarships under chapter 2. Paragraph 7 says:

> The Committee believes, insofar as the assistance given by the Federal Government is concerned, it should not at the present time in light of considerations presented in this chapter undertake to provide new scholarships other than work study which has been discussed for undergraduate students. To the extent that other sources should prove, after a fair trial, to be adequate to meet the requirement of the Federal scholarships, the Committee would favor a Federal scholarship program only as a way to fill the gap.

The general tenor and philosophy of this is that that actually led me to believe you were far closer to Mr. Gwinn than we believed by your statement today.

Mr. JOSEPHS. You were surprised in my statement that I came out in favor of the scholarship program?

Mr. WAINWRIGHT. Only in lieu of particularly what I quoted.

Mr. JOSEPHS. A certain number of things have happened since the report came out, and it seemed to me, personally, and maybe the other members of the committee would not feel the same way, it seemed to me worthwhile trying the experiment. Our Committee was by no means unanimous on the subject of Federal scholarships. There were a number of people on the Committee who believed there should be Federal scholarships and they should be quite substantial.

Mr. WAINWRIGHT. Thank you, Mr. Josephs. I have no further questions, Mr. Chairman.

Mr. ELLIOTT. Mr. Josephs, I would like to say that I have enjoyed and deeply appreciate your testimony, and I would like to say further, as the author of the bill creating your study group, that I think you did an excellent job, something that needed to be done in that field, and though you did have troubles with it—I know your money was short many times, and that was not your fault—that you have given us a fine working base for this whole undertaking.

I hope that we may be able to do something in this field, and I hope that we may do the right thing and whatever program we undertake will be something that is helpful and is in accord with the best thinking of what should be done in these fields.

I thank you very much.

Mr. JOSEPHS. I am most grateful to you for giving me the chance. I am afraid I ran on a lot of different subjects, but you will forgive me.

Mr. ELLIOTT. Your statement was very helpful, and we thank you.

(Pursuant to the direction of the chairman, the following material is made a part of the record:)

STATEMENT OF HON. THOMAS J. LANE BEFORE THE HOUSE COMMITTEE ON EDUCATION AND LABOR, IN SUPPORT OF H. R. 8571, A BILL TO PROVIDE FEDERAL INSURANCE FOR LOANS MADE TO SCIENCE AND ENGINEERING STUDENTS FOR TUITION

EDUCATION—THE "ULTIMATE WEAPON" TO WIN "STRENGTH FOR PEACE"

Mr. Chairman, since I introduced a bill to provide Federal insurance for loans made to science and engineering students for tuition, on July 8, 1957, fast-moving developments have shattered our complacency.

What seemed advisable then, has become imperative now. The Russian success in opening up the age of space has shocked us out of our lackadaisical attitude toward education. We have come to realize that the trained capacity to think is not merely a sideline but the very essence of our way of life.

To design and produce intercontinental missiles, to explore space, and in everything required to win peace and progress, education is the key.

The New York Times of October 27, 1957, quotes the Educational Testing Service as reporting that lack of money keeps many of the best high-school students from college. "Some 150,000 high-ability students would have gone to college had adequate financial support been offered them."

Benjamin Fine, of the Times, has this to say: "To help the qualified students enter, many colleges offer scholarships and student loans. Even though scholarships have jumped 100 percent in the last 5 years, still not enough is done to meet the tremendous demand for help. The hunger for scholarships was highlighted last Tuesday when 300,000 high-school seniors took part in the Merit Scholarship examination. This is probably the most intensive talent hunt in our Nation's history. The examinations are sponsored by the National Merit Scholarship program, set up 2 years ago with a $20 million grant from the Ford Foundation. Since then, business and industry have added several million dollars.

"The results of the Tuesday tests will not be known until early spring. Of the 300,000 who took the difficult examinations, 7,500 will enter the semifinals of the merit program. The final winners will split about $4 million among them. Only 800 of the 300,000 who sought help through scholarships will actually get any kind of financial asistance. What happens to the other 299,200 eager candidates?

" 'This waste must stop,' one educator insisted. 'We can't afford the luxury of keeping our best brains out of college.' "

Even the cautious recommendations of the President on this subject will fail to eliminate this waste.

Soviet Russia is training scientists and engineers at a rate that will leave us far behind unless we exert ourselves to the utmost. Incidentally, in that Communist society, they do loan money to bright students to open the doors of educational opportunity for them while we cling to the old formulas of financing the higher education of promising students; the formulas that are inadequate to meet the demands of the space age. What incentives do we offer?

To digress for a moment, I would like to point out that the highest salaries in the United States are paid to business executives and movie stars, while in Russia the highest salary is paid to the president of the Soviet Academy of Sciences.

The more I think of the critical challenge confronting us, the more I am convinced that our survival depends upon a bold and generous program to make our educational system the best in the world.

The bill I have introduced—

To provide Federal insurance for loans made to science and engineering students for tuition is a modest step in that direction. I realize that much, much more must be done to make up the deficit of our longstanding neglect of education. But it is a beginning.

For the purpose of facilitating loans for tuition to science and engineering students in institutions of higher education, lenders shall be insured by the United States against losses on loans made by them to such students after January 1, 1958, if made upon the conditions and within the limits specified in this act. The total principal amount of new loans to students covered by insurance under this act in any fiscal year shall not exceed $25 million.

From this beginning I hope that other and far more expansive programs will develop so that American education becomes the ultimate weapon that wins, strength for peace.

(Whereupon, at 12:15 p. m., the hearing in the above-entitled matter was recessed, to reconvene at 10 a. m., Tuesday, February 18, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

TUESDAY, FEBRUARY 18, 1958

HOUSE OF REPRESENTATIVES
COMMITTEE ON EDUCATION AND LABOR,
SUBCOMMITTEE ON SPECIAL EDUCATION AND
SUBCOMMITTEE ON GENERAL EDUCATION,
Washington, D. C.

The committee met at 10 a. m., pursuant to recess, in room 429, Old House Office Building, Hon. Graham A. Barden (chairman) presiding.

Present: Representatives Barden, Perkins, Wier, Elliott, Landrum, Roosevelt, Zelenko, Thompson, Holland, McGovern, Dent, Gwinn, Kearns, Frelinghuysen, Nicholson, Ayres, and Griffin.

Staff members present: Fred G. Hussey chief clerk; Charles M. Ryan, general counsel; Kennedy W. Ward, assistant general counsel; Russell C. Derrickson, chief investigator; Mary P. Allen, clerk (Subcommittee on Special Education); and Robert McCord, clerk (Subcommittee on General Education).

Chairman BARDEN. The committee will come to order.

Gentlemen, I did not know of any business to come before the full committee this morning. However, I did give notice of the meeting in case someone did have a matter to bring before the committee.

What I really had in mind was, if there is no business before the full committee, to turn the committee over to Mr. Elliott, the chairman of the subcommittee.

Mr. PERKINS. Mr. Chairman, may I ask a question?

Chairman BARDEN. Yes.

Mr. PERKINS. Just how are we getting along with Public Law 815 and Public Law 874? When will those bills be before the full committee?

Chairman BARDEN. It is my information that Mr. Bailey is getting along pretty well with it and hopes to be out with those bills probably within a week.

My information has just been reinforced by a direct report from the committee. They do hope to have that bill out within a week.

Is there any other matter? If not, I shall turn the gavel over to Mr. Elliott, who has something of interest to the full committee as well as his subcommittee.

Mr. ELLIOTT (presiding). Thank you, Mr. Chairman. I feel that the committee is very fortunate today to have as its witness Col. J. W. Knighton, of the Philco Corporation of Philadelphia, and also Mr. John R. Booth, director of the TechRep division of the Philco Corp.

If you gentlemen will come around, we will be glad to hear you.

STATEMENTS OF COL. J. W. KNIGHTON; JOHN R. BOOTH, DIRECTOR, TECHREP DIVISION; AND J. R. LEWIS, MANAGER, PROGRAMS AND PLANNING, TECHREP DIVISION, PHILCO CORP.

Colonel KNIGHTON. Mr. Chairman, I would like to introduce Mr. John R. Booth, the director of the TechRep division of the Philco Corp., who has a very short prepared statement.

Mr. BARDEN. Would you care to sit with him, Colonel Knighton? We might ask you questions as we go along, too.

Mr. BOOTH. Gentlemen, we are happy to have this opportunity to suggest to your committee a method of minimizing the shortage of technically trained manpower.

The TechRep division of Philco Corp., with its 17 years of worldwide experience in the training and use of technically trained manpower at all skill levels, is keenly aware of the know-how shortage which exists and its effect on national security. In the light of this experience, the Philco TechRep division and its technological center has given a great deal of thought to various methods of alleviating the shortage. We have devoted many months to the evaluation of proposed solutions.

The solution we are suggesting to the committee details one phase of a program which is more broadly covered in the literature which will be left with the committee. We propose a sound method of alleviating the shortage of technically trained manpower.

Our solution is not a panacea which will pluck technically trained personnel out of thin air, but it does overcome one flaw inherent in other possible solutions—namely, the time required for the solution to make itself felt. The college training alone for an engineer or scientist requires time which is measured in years, and changes in a scientific curriculum to shorten this time cannot be made instantaneously.

The complete program which Philco presents for your consideration seeks to increase the useful output of scientists and engineers already trained, but presently enmeshed in many routine duties which could easily be performed by technicians. With proper training at the technician level, the results of such a program would be apparent in a matter of a few months rather than the years required to fully train high-level scientists and engineers.

Our complete program also offers a tested and proven method of training which can be applied wherever a need exists, and it furnishes a continuing method for keeping scientists, engineers, technicians, and skilled maintenance or operating personnel informed regarding new developments or advances in the art.

Finally, our complete program is designed to apply equally well to all levels of technical instruction such as:

(*a*) Students in academic or technical-vocational high schools. (Basic training for their technical knowledge.)

(*b*) Engineering students in colleges and universities. (Practical aspects of engineering are applied. They have an understanding of what they are studying.)

(*c*) Scientists, graduate engineers, technicians, and other skilled personnel in industry who must be kept informed regarding new techniques such as single sideband and forward scatter communications; new devices such as various types of computers and computer systems;

and new components such as transistors, semiconductors, et cetera. All of these programs used in the high school, in the universities and colleges, and in advanced areas can be applied to personnel serving with the Armed Forces, and similarly it can be applied to trained personnel in allied countries needing some know-how assistance.

In order to meet the scientific requirements of the future, we must motivate students, parents, educators, industry, the Armed Forces, and our allies to adopt usable programs designed to reach our objectives for training technical personnel.

It is Philco's sincere hope that the ideas expressed here will help the committee in the overall evaluation of the problem and lead to an effective and economical solution.

At this time, gentlemen, I would like to present to you Mr. J. R. Lewis, manager of the programs and planning department of the TechRap division. Mr. Lewis is one of our key personnel in the development of the program we now present to you.

Thank you.

Mr. WIER. Would the gentleman yield before you pass on to your colleague there?

Mr. BOOTH. Yes, indeed, sir.

Mr. WIER. I am wondering if you can answer the question of whether or not our Government is making use of all the available, let us say, technicians that you referred to, those with degrees from colleges and universities in the various fields of science and so forth?

It came to my attention in Minneapolis—that is the city I represent—that there, because of cutbacks on contracts and layoffs, there are available in our area up there any number of men that are well developed in this field, but they are unemployed.

Most of the members of this committee come from urban centers and I am just wondering whether or not there is this so-called available number of men in the profession. Are we making use of those that we already have sent through colleges and universities?

Mr. BOOTH. Well, sir, that is a rather difficult question to answer directly, in all honesty, for the simple reason that it covers such territory that it is hard to evaluate it. I might say this, however, from my impression of your question: That we will, from time to time, have peaks and valleys where we are very short of people, and at other times seem to have an excess amount. That will be occasioned whenever you have any changes in the overall activity of an industrial nation such as this.

It happens frequently when plants are retooling or coming into new designs. There are periods of excess personnel, and then again when production reaches its peak and the consumption is taking the product you will have shortages.

We have been through both areas in the 17 years that I referred to. There are times when we really have to dig and hunt to get people capable with enough know-how to do the work that we are talking about.

Right now, at this particular moment, because of general conditions, there is an excess because some plants have closed down on some of their production requirements. There seems to be an indication, however, that that will be changing and I could not help you predict that situation at all. I am not capable on that point.

Mr. WIER. Thank you.

Mr. BARDEN. Mr. Chairman, may I just say a word here in order that the committee might understand how this came about?

About 3 years ago, I believe it was, I was very much interested, as I have been for many years, in the vocational training program.

At that time Dr. Mobley, head of the vocational setup here in Washington, was in touch with Colonel Knighton, whom I have known for many years. He was with the Marine Corps and has a very fine record with the Marine Corps, and at one time was liaison man between the Marine Corps and the Hill, and there never was a better one and never will be a better one than he was when he was looking out for the Marine Corps in pretty rough days.

At that time I got together with Colonel Knighton, who was tremendously interested in just exactly what he is bringing here today. At that time it impressed me, but I did not see exactly where it would fit into the problem or the picture at that time. Therefore, when this came up the other day, I took the liberty to call Colonel Knighton and ask him if he had the setup in such a way that it could be presented to this committee and told him that this committee was looking for information.

We did not know just where we would eventually wind up in the field, but we wanted to have him. He very kindly consented to come here with some of the people of Philco. He told me it was not a selling proposition and that the system they have in mind is being used all over the country, as far as that is concerned, so I invited him here after conferring with Mr. Elliott.

We thought it was a good idea and I am sure it will be interesting to the committee. I thought I would just make that statement so you would understand that Colonel Knighton has not come barging in here with some policy of his own. I was looking for him, rather than he looking for me.

Mr. Chairman, I see the Commissioner of Education, Mr. Derthick, here, and since he is equally interested in this, I think it would be quite appropriate if Mr. Derthick would come up here where he can look at this and probably get a better view.

Mr. DERTHICK. Thank you.

Mr. ELLIOTT. I would like to say at this point that we are very happy to have you, Mr. Commissioner. We are happy to have you sit with us, and according to my schedule you will be with us again tomorrow.

Mr. DERTHICK. Thank you. That is right.

Mr. ELLIOTT. However, in a different capacity.

Mr. DERTHICK. Yes. This is a more honored seat and more comfortable seat and I appreciate it.

Mr. ELLIOTT. Mr. Booth, as I understand, you have a plan that you want to present to the committee that would show us how America might, while there is some considerable shortage of engineers, make better use of the engineers we have through the training of technical people who can do in many instances the work now being performed by engineers. That is one of your missions here, is it not?

Mr. BOOTH. That is correct, sir.

Mr. ELLIOTT. You have with you, as you mentioned, Mr. Lewis, of the programs and planning department of your concern, and we will be happy to hear from him now.

Mr. BOOTH. I might say, gentlemen, that our thinking has nothing to do with today's problem. It is every day's problem, the problem of the future. We have to take young people and bring them along with proper guidance so that they are prepared to meet the challenges that they are going to face at a later date and Mr. Lewis will point that out to you.

Our thinking has nothing to do with what is going on in the United States today other than to get ready for tomorrow.

Mr. ELLIOTT. Will you be available for additional questions, Mr. Booth?

Mr. BOOTH. Yes, sir.

Mr. ELLIOTT. You may proceed, Mr. Lewis.

Mr. LEWIS. Mr. Chairman and members of the committee, this is a plan prepared for Hon. Graham A. Barden, Member of Congress, and chairman of the Education and Labor Committee, House of Representatives, Congress of the United States.

The plan for electronics training in high schools which follows has been prepared by the technological center, Philco TechRep division, Philadelphia, Pa.

Mr. ELLIOTT. What is the meaning of "TechRep"?

Mr. LEWIS. That is a coined word, sir, taken from "technical representative," and covered our original task, providing technically trained manpower for various customers, military and industry primarily. It is a separate division of the corporation.

Since Philco is most widely known as a television, radio and appliance manufacturer, we would like to take just a couple of minutes to explain that its Philco TechRep division has for many years been a pioneer in the technical training field and is recognized as a leader in the field of electronics training, and is, therefore, well qualified to present this plan to you today.

Our experience in electronics and technical training dates back some 27 years, and the company's capabilities were already recognized at the outbreak of World War II when the Government called upon Philco to train electronics specialists for the Armed Forces.

Philco immediately established the Philco Training School and trained over 18,000 electronics specialists for the Armed Forces during the war.

New concepts in training that lead to today's advanced methods grew out of that experience. To further develop ways and means to train engineers and technicians on all scientific advances, the Philco TechRep division established the Philco Technological Center, a complete training center which offers comprehensive correspondence courses on technical subjects, as well as other technical training programs designed to help technical and scientific personnel keep pace and familiarized with all scientific advances.

Philco made major contributions to the establishment of the Navy's airborne coordinating group, now called NAESU. This organization still exists today and is a model for conducting electronics training at advanced levels.

Following World War II, Philco's TechRep division expanded its training facilities with the Armed Forces, Government agencies, industry, and many foreign countries. For example, Philco has trained literally hundreds of thousands of electroncs specialists for the Armed Forces of the United States and NATO countries.

We feel that this brief summary will give you an idea of Philco's tremendous background of experience and know-how in electronics training. Currently our activities continue with the Armed Forces at such installations as Fort Monmouth, Fort Bliss, Air Training Command, Redstone Guided Missile School, Naval Air Technical Training Center, at Memphis, Tenn., United States naval shipyards, and many, many more too numerous to mention; with industry in such diverse industries as Bell Telephone Co., both in the United States and Canada, Newport News Shipbuilding & Dry Dock Co., Lockheed Aircraft, Allegheny-Ludlum, Todd Shipyard, plus many, many more; with colleges and universities, such as the United States Military Academy, the United States Naval Academy, College of William and Mary, and Oklahoma A. and M.; with United States Government agencies, such as Central Intelligence Agency, Coast Guard Academy, National Security Agency; with foreign governments—in France, the Netherlands, Norway, Peru, Portugal, Thailand, Liberia, Argentina, Canada, Cuba, Formosa, Greece, Turkey, the Philippines, and Brazil.

It is from this extensive experience that Philco has developed proven electronics training programs, and long ago recognized the need for adequate electronics training in our high schools.

To meet this need, the Philco TechRep division developed special programs for electronics training in high schools. These programs have been proven and are now in use in many high schools, such as the Mergenthaler Vocational and Trade High School in Baltimore, Md.; Bethlehem Vocational High School in Bethlehem, Pa.; Springfield Trade High School in Springfield, Mass.; Danville Technical Institute in Danville, Va.; the A. A. Hansen Trade High School, Waltham, Mass.; Broome County Technical Institute in Binghamton, N. Y.; Melvin V. Weldon Vocational High School in Medford, Pa.; Edmunds High School in Burlington, Vt.; Everett Vocational High School, Everett, Mass., and Spaulding High School in Barre, Vt.

Many more school officials with whom we have talked are keenly interested in initiating this program, but are unable to do so because of insufficient funds. This is the major deterrent to more widespread use of the program.

It is from this extensive background in electronics training and with these proven programs that have been developed through the years, and with a knowledge of the problems incurred in implementing these programs that we submit this plan to you today.

A plan for electronics training in academic and vocational high schools: Advances in electronics technology have made electronics scientists, engineers, and technicians vital to our national defense, essential to our expanding economy, and important to our international commitments.

The demand for trained electronics manpower has outstripped our existing educational capabilities in this vital scientific field. Not only are we not keeping pace with present demands for electronics specialists, but we are jeopardizing our future by not training sufficient

scientists and engineers to keep us ahead in development, nor enough technicians to support the future level of the technology.

There exists in this country today a serious shortage of adequately trained electronics manpower in every skill level from master scientists to the semiskilled technician.

Mr. GWINN. What authority have you for that statement?

Mr. LEWIS. The statistics on which we base that statement, sir, were gleaned from the best available information that we could find in the public press, from witnesses before other congressional committees, and published books, and represents, we believe, a consensus of opinion. We realize that there are those who say to the contrary, but we believe that this is a consensus of the best opinion.

Mr. GWINN. We often find that we get a consensus of opinion that starts in one place in Washington. After a while it is a national opinion. It is a good idea to know where it starts and you still do not tell me any specific, independent source of information. The press may print everything it says from some bureau here in Washington.

Mr. LEWIS. I do not believe that I am prepared today to hand you specific references, sir, but I could, I believe, provide you with representative references if you so desire.

Mr. GWINN. I think when you make statements we ought not to be left to assumptions that may be mere repetitious statements.

Mr. BOOTH. Mr. Chairman, I might say that one of our guides is the "help wanted" advertising columns of the newspapers throughout the United States. Because of the nature of our work, we have five men who spend their entire time conducting interviews in local areas, traveling through the States, "putting on hooks," if you so care to express it, prospective technical personnel that could be located if the need develops.

Now, at no time in the 10 years that I have consecutively followed this technical shortage problem have I seen any newspaper that was not advertising for technically qualified people for one reason or another. If one manufacturing plant is decreasing its activities, another one is increasing its operations, and I do not think that American business concerns would be advertising steadily in newspapers if they had a complete staff of employees and all work was being conducted to their entire satisfaction. Therefore, I think that constant references to newspaper advertisements is probably as good a guide as we can possibly find because it would be almost impossible to tabulate the requirements of every individual business, of every individual agency, of every research and development activity, and verify all such needs, either Government or business.

It would be very hard to get such facts. We will have to go, I think, largely on what we do get, as Mr. Lewis says, from the newspapers, from other people who have studied the situation and from "help wanted" advertisements which indicate who wants what type of skill and what they are willing to pay for it. You have seen the rates go up in recent years because there is more and more demand for technical capability.

Mr. FRELINGHUYSEN. Mr. Chairman, will the gentleman yield?

Mr. GWINN. Yes.

Mr. FRELINGHUYSEN. Mr. Booth, as I recall your testimony, you pointed out that one reason why we might need to train more tech-

nicians would be to release those with greater qualifications, scientists and engineers, for more important jobs.

Mr. BOOTH. That is correct.

Mr. FRELINGHUYSEN. So it might be a misuse of talent to some extent that would require this additional amount of technically trained people. Is that your argument?

Mr. BOOTH. In many instances today a project engineer, regardless of his field, research and development, or getting ready for production, or acting as an engineer that takes an area of special responsibility, has to use a great deal of his time to get facts and information and plan work that could be performed by technicians. The scientist or engineer will be assisted greatly if he had 2, 3, 4, 5, and maybe if he handles several projects, many more technical assistants who could do the benchwork, prepare reports from tests or evaluation studies, so that the engineer could devote his time to the engineering and the administration of the combined programs that he is trying to develop or complete.

Mr. FRELINGHUYSEN. It is like asking a doctor to do routine administrative work when he could be doing something more vital.

Mr. BOOTH. That is right. Our educational institutions have developed in that field technical secretaries who have great capabilities and have greatly assisted the registered nurses and the physicians. Gentlemen, we are speaking of electronics. We think that every category has a parallel.

When I was a youngster, high-school physics was a subject with relatively limited scope. Because of scientific developments physics has so expanded that portions formerly treated in a limited manner deserve to be expanded and treated as individual subjects. Yet the time devoted to physics in high school has not been expanded commensurately.

The complexity that we face must be simplified and organized in order to explain it to students. We have to break complex matters into little pieces and have those mesh like a crossword puzzle so that they come together and make sense to the student. We have to train persons with mechanical ability to maintain our automatic equipment, to maintain our mechanical equipment, to operate power sources, and things of that sort.

We need technical personnel experienced in business administration to handle our logistical requirements so that when we encounter electronic problems, we have the capability in every category which is needed.

Mr. GWINN. Mr. Booth, out of that newspaper advertising for engineers, it would be very difficult to get figures on shortage, unless you have some way of measuring the number that a given advertiser turned up short with. They may all be filled or maybe an exchange arrangement is going on there, the newspaper simply being in a sense an agency for employment.

There may be as many persons ready to fill the job as there are jobs, so that it would be difficult, would it not, to get any figure of shortage out of what you mention as newspaper advertising?

Mr. BOOTH. I do not think it is possible to get a figure that would answer all your questions. I think in some cases you have to consider the situation and use the very best judgment that you can apply.

Mr. GWINN. The thing that I was interested in, as was apparently the gentleman from New Jersey, was the statement that you have made, and the Society of Engineers has made this, that the trouble is that we have a lot of trained men doing work that is beneath their ability and we are not utilizing the technical ability that we have properly. I take it that is what you are going to get at here; is it not?

Mr. BOOTH. It is in that parallel; yes, sir.

Mr. HOLLAND. Would the gentleman yield?

Mr. GWINN. I am through.

Mr. HOLLAND. Do you not think that what you are trying to tell us is this: In this age of automation we have engineers who are taping machines, and the technicians should be taping those machines instead of engineers; is that not right?

Mr. BOOTH. That is right.

Mr. HOLLAND. Of course, we are talking about full employment, which we do not have at the present time, but in full employment we are going to need all these technicians to tape machines because we are really running our steel industry today, which I am very well acquainted with, with engineers who are taping the machines, and you should have a technician there to do the same type of work.

Mr. BOOTH. If we had nothing else, we would have the attrition that comes with age, so we must have replacements coming for that condition. Either we are going to broaden and increase our consumption one way or another, or we are not. If we are going to close up shop, then you do not need technical education, but if we are going to progress as our history indicates we should, then I think that we must start to prepare now because people who have considered the matter, and I think you gentlemen are probably in agreement with them, have agreed that you cannot wait to educate a person late in life.

A student must get high-school basic education during high-school age and must complete advanced education in general at college age.

Mr. DENT. Mr. Chairman, would it not be good for us to hear the plan before we discuss its merits or demerits? All we have is preliminary discussion. Let us just see what the plan is and then discuss it.

Mr. ELLIOTT. The gentleman, Mr. Lewis, may proceed with his plan.

Mr. LEWIS. I think it is obvious from this discussion so far that industry, the Armed Forces, Government agencies, and educational institutions all have been concerned with this situation. Many have undertaken remedial action aimed at the problem from their individual viewpoints with a wide variation in results.

The need exists for an overall plan for electronics training beginning in our high schools, providing motivation and basic training for those who will become the scientists and engineers, and providing a sound and complete technical training for those who will become the technicians.

This training must start in the high schools. At least 500,000 high-school graduates each year who are considered intellectually capable of successful careers in science do not go on to advanced training. With proper motivation and training in high school, many of these would choose scientific careers, and thousands would select the electronics technology.

Many agencies in Government, industry, education, and other interested and affected segments of our economy have made extensive stud-

ies of the need for electronics training, and based upon these studies and the counsel and recommendation of these groups, concepts fundamental to a sound plan for electronics education can be enumerated and essential ingredients for an effective program can be defined.

This program must (1) begin in early high school; (2) make maximum use of existing facilities and capabilities of our educational system; (3) recognize the distinctly different needs of: (*a*) the academic high school, (*b*) the vocational high school; (4) provide a firm base for either scientific and engineering or technician careers; (5) teach electronics as a separate subject on a par with physics and chemistry; (6) emphasize the advantages of career opportunities in this field to both students and parents; (7) allow for participation by local industry to increase motivating forces and insure prompt and efficient utilization of graduates.

This program requires, first of all, capable teachers. These teachers must be provided with:

(1) Indoctrinational training, adequate financing for attending summer courses, and guidance and advisory assistance.

(2) A comprehensive textbook developed for the high-school level, interesting, clear and complete.

(3) Training materials correlated to the text:

(*a*) Demonstration equipment that improves and simplifies presentation.

(*b*) Laboratory equipment that enables the students to perform practical and interesting projects.

(*c*) Lesson plans, laboratory workbooks, and other course material which provide teachers and students with a completely organized program.

(*d*) Visual aids for maximum teaching efficiency.

In other words, we need properly indoctrinated teachers with an organized electronics curriculum which correlates the textbook, the laboratory equipment, presentation devices, workbooks, and all materials for a complete and sound high school program, for both the academic and vocational high schools.

Mr. KEARNS. Mr. Chairman——

Mr. ELLIOTT. Mr. Kearns?

Mr. KEARNS. At that point where do you have the source of those teachers?

Mr. LEWIS. We are coming to that.

Mr. KEARNS. You mean that they should have special training?

Mr. LEWIS. That is right. We will attempt to show how existing, available teachers can be prepared for electronics training and, by inference, for other new and important technologies.

In the academic high school, principles of electronics science must be emphasized to give students the educational foundation for continuing on to college and scientific and engineering careers. One year is recommended as we see it. In the vocational high school, however, application of electronics principles must be emphasized to prepare students for employment as a technician immediately after graduation, and basically equipped to go on to scientific and engineering careers. Three years is recommended here.

Complete training packages exactly suited to these two specific requirements must be made available to get effective electronics training programs started immediately.

All essential components for these packages are available now, and as we stated earlier, these programs are now in use and thoroughly proven in a number of high schools around the country. They include:

(1) The text, specially developed and prepared for the high school students to cover the subject from basic principles through typical applications, planned and organized to take full advantage of the teacher's time, completely correlated with the demonstrations, laboratory experiments, workbooks, and so forth.

(2) The demonstration equipment, which presents the principles and applications of electronics in modular units, just like building blocks. These units are basic circuits and can be joined together to form actual, functioning systems on the console demonstrator right in the classroom. As each unit or circuit is added, the teacher can easily explain its function and its relationship to the entire system. Students progress logically and steadily through this interesting and simplified method. All demonstrations are correlated to the textbook.

Mr. DENT. Who makes that equipment?

Mr. LEWIS. We make it for our own use and we have been providing it to the high schools.

Mr. ELLIOTT. How many high schools have that equipment already, sir?

Mr. LEWIS. I do not believe I have that information with me, sir. I would estimate a couple dozen.

Mr. ELLIOTT. Only a couple dozen?

Mr. LEWIS. That is right. It is primarily a matter of funds, and from my own knowledge of it, the new high schools are usually the ones who are able to anticipate and fund for this type of training.

Mr. KEARNS. What is the cost to equip one high school?

Mr. LEWIS. I will come to that in a moment, sir, if I may.

Mr. KEARNS. All right.

Mr. LEWIS. (3) Laboratory equipment. This equipment follows the same modular concept as the demonstration equipment. There is a counterpart laboratory unit for each of the modular demonstration units. With these the student can duplicate the actual functioning systems which the instructor has presented on the demonstrator, extend the demonstration coverage, and perform investigations and experiments of all kinds. This equipment presents a challenge and encourages students to expand their knowledge in the field. Laboratory equipment is correlated with the demonstration equipment and, of course, the text.

(4) Associated materials. There are lesson plans, laboratory workbooks, and all other necessary course materials, all completely organized and correlated to the text, and audio and visual aids judiciously selected and incorporated into the program to add excellent supplementary support.

(5) Indoctrinational training for teachers. Summer seminars for teachers will enable them to quickly adapt their training and knowledge by providing intensive instructions in both electronics technology and in the use of the packages.

Mr. ELLIOTT. Where are those courses held now, Mr. Lewis?

Mr. LEWIS. We have conducted them in Philadelphia for special purposes. We have not made them generally available because we are not primarily in that business.

Mr. ELLIOTT. Thank you.

Mr. LEWIS. Seminars are conducted by experienced electronics instructors in locations convenient to the teachers. Separate seminars will be held for academic and vocational high-school teachers.

Reasonably accurate estimations of the costs of these programs are, and these are based upon estimates on the materials and packages which we have ourselves prepared and are presently making available, for the academic high school, about $2,350, and for the vocational high school, about $25,000. Included in the packages at this cost are appropriately selected classroom equipment, laboratory equipment, laboratory benches, laboratory tools, test equipment, textbooks, instructor manuals, student manuals, reference library, and repair parts.

The above packages are designed for lecture and laboratory classes of up to 20 students each. Forty students could be in electronics training simultaneously, with half the class in the morning in lecture and vice versa in the afternoon, and when used in three successive grades, training could be scheduled for up to 120 students, with the above listed equipment.

Mr. GWINN. Could that be increased by television or visual equipment?

Mr. LEWIS. I do not believe I am qualified to discuss that, sir.

Mr. GWINN. You spoke of visual aids.

Mr. LEWIS. I am speaking there, sir, of the more conventional films, slides, and sound films. It should be pointed out that the equipment we are talking about is nonobsolescent because of its building-block nature. If something new is invented you add a block. You do not throw the whole thing away.

A conservative estimate of the life of the equipment is at least 20 years. They are built for classroom use. This brings the cost per year per student, or per student class hour, to a very economical figure.

Estimated costs for teacher indoctrination: The cost per seminar based upon 6-week seminars of 20 teachers each is $9,600. This averages out to about $2 per student hour and this cost could be cut to approximately $4,800 if seminars could be conducted continuously throughout the year, rather than all at the same time, say, in the summer.

Mr. ELLIOTT. How much is that figure per teacher, Mr. Lewis?

Mr. LEWIS. It is about $480 a piece, sir; 20 teachers in a class at $9,600.

Mr. ELLIOTT. In other words, it is not $9,600 for one teacher.

Mr. LEWIS. No, sir.

Mr. ELLIOTT. For 20 teachers.

Mr. LEWIS. That is right.

This chart is a cost comparison that someone asked about, the cost comparison for equipping a vocational high school to handle representative trades and crafts. Electronics, as described in this program, $25,000; a machine shop, $100,000; printing, $70,000; building trades, from $15,000 to $20,000; practical nursing, $17,000; auto shop, $15,000; beauty culture, $10,000; distributive education, $8,000.

The cost for each trade or craft vary, of course, but the figures above are representative of the costs involved, and I might say that we got them by contacting quite a number of new high schools that are going up in our part of the country.

Mr. GWINN. Mr. Lewis, I think it was Admiral Rickover testifying here the other day who indicated that he thought it was an improper burden on the taxpayer and not a very practical way to teach high school students these subjects in schools and that industrial training itself would be a quicker and better way of educating.

Do you have any ideas on that?

Mr. LEWIS. I have a great deal of respect for the admiral, but I disagree with him on that.

Mr. GWINN. It would be cheaper, of course, to the industry if the taxpayer would attend to all this printing and typing, and all that business, but are you not very good teachers of technicians in your own plants?

Mr. LEWIS. Generally speaking, the technicians for our own plants are upgrade-trained from something that is basically trained outside of the industry itself.

Mr. GWINN. You take them from the high schools?

Mr. LEWIS. From the high schools, from the local technical institutes, and convert them to the technicians. I am not speaking of a line troubleshooter or something like that, which is a fairly low-level technician and can be usually trained in a matter of a few hours, his primary duty being to see whether a needle comes up to a certain point on the gage and if it does not come up there, he discards that unit and calls for a technician.

Mr. GWINN. Are there a substantial number of private schools in this business of teaching technicians?

Mr. LEWIS. I think perhaps I might touch briefly on that and at the same time may be answer an earlier question of yours. Your question, I believe, earlier was with regard to the extent of this shortage in technicians.

A pretty generally accepted estimate of the number of technicians that could be profitably used by an engineer ranges from 2 to as high as 10, depending upon the type of work that is being done by the engineer, but if we were to just take the minimum of that estimate, 2 technicians per engineer, and, knowing that our present output of engineers is somewhere between 25,000 and 35,000, I believe, by the latest statistics, it would seem then that we should have at least 50,000 technicians per year being graduated. The latest figure I had on that was that something in the neighborhood of 15,000 technicians were being graduated from recognized technical institutes, or post-high-school type of training.

Mr. BARDEN. Mr. Chairman, would you let me make just one statement?

Mr. ELLIOTT. The chairman of the full committee, Mr. Barden.

Mr. BARDEN. I would like to say this, Mr. Gwinn: I do not know the admiral personally to whom you referred, but from the best figures I can get the most expensive educational system I know on this earth is in the Defense Department, and, of course, we are probably unconscious of the fact that here we are looking at equipment that kind of makes us cringe a little bit when we see an electronic laboratory costing maybe $20,000 or $25,000. It might be interesting to you to visit some of these defense laboratories where there are somewhere from a quarter to a half-million dollars of equipment in there, and if they do not like this kind of education, then why are they constantly advertising to the world and to everybody in America that they are

offering some nearly 200 different courses of education in the Defense Department?

I do not know the admiral, and I am sure he is a fine gentleman and a good admiral, but if we had some of the equipment that they have, we would not be worrying like we are now. I felt that that ought to be said, because I do not want anybody from the Defense Department suggesting economical ways of running a competitive educational system to me.

Mr. GWINN. You can go on talking about the Government as long as you want to.

Mr. HOLLAND. And he has never worked a day in industry in his life.

Mr. BARDEN. I just thought we ought to know that, because we are charged with some knowledge about the whole educational setup in this country.

Mr. LEWIS. In conclusion, then, based upon the need for accelerated electronics training and upon this logical program that can be initiated immediately and can produce effective results at an economical cost, we recommend that consideration be given to provide the necessary funds and that a Government agency be appointed to handle the administration of this program.

Thank you.

Mr. Chairman, I have with me a couple of representative samples of this equipment that we have been using in our own school and which we have been providing to the Armed Forces and to the various high schools if the committee would be interested.

Mr. ELLIOTT. You may proceed to exhibit them, Mr. Lewis, if that is your desire.

Mr. BOOTH. The committee may be interested in learning how this equipment was developed. Our original approach, and one which is still in use in far too many schools, was to assemble parts into circuits on "breadboards." The instructor would use these in his lecture to some extent, and then the student would carry out certain sterotyped exercises using them. Unfortunately, much time was lost in meaningless repetition of certain mechanical manipulations by the student, such as soldering and wiring—so that too little time was available for learning electronics. Moreover, the "haywire" contraptions would often malfunction in such a way as to produce incorrect results for the experiment being performed, introducing wrong ideas into the student's mind.

With the materials we have developed, we can truly teach by telling, showing, and doing as is recommended by so many eminent teachers.

Mr. LEWIS. Just another little bit of history that might interest the committee. We had been using this equipment in a relatively crude form in our own school and some visitors from the Philadelphia Naval Shipyard training activity for their electrical and electronics shop happened in and saw them. Recognizing their potential, they wanted to buy what we were using right in our own labs, and, of course, we refused to sell them in that particular form because we recognized the problems that would be inherent in something that had not been processed for production. We proceeded then to process into production the equipment which I will show you.

For the use of the instructor we have provided all of the important basic electronics circuits as actual operational units built up on an

aluminum panel with the wiring actually on the back of the panel in a very simplified form compared to an actual piece of electronic equipment, but even more simple on the front where we have printed the circuit in its symbolic form and mounted right alongside of it the actual electronic component.

The electronic components are removable so that the instructor may, if his class is at a fairly high level, dicuss design criteria, and point out the effects of a change in value of that component, or if he is teaching the conventional troubleshooter type of technician he puts in a defective component and he does not merely have to say, "Now, if I have a defective component here, this will not work." It will not work.

It really holds the students' attention. Furthermore, we provide them with a fine selection of defective parts and it may strike you as being a little absurd, but believe it or not they cost more than good ones because we have to have them made especially and marked especially, and, of course all that special handling costs more.

Nevertheless, they are worth it because you can really demonstrate the circuit both as a correctly functioning unit and as a malfunctioning unit, and you can tie together your theory along with the practical aspects of it.

To make it convenient for the lecturer, we then proceeded to build up what we call a console. This sample is a very miniaturized version of it, and stored in here are the individual panels themselves. They can be taken out and slipped into place here and the instructor can proceed to demonstrate one circuit, tell all about it, and show his students anything he wants. After he is sure they understand one circuit, he then pulls out another circuit and he teaches that circuit with all its implications.

By this method, he is able to take two simple circuits which a student can understand and tie them together to make an operating, functional unit. This has a great deal of dramatic appeal and keeps the students' interest at a high peak, and so you have here this selection of these basic circuits which enables the instructor, say to build a PA (public address) system, a transmitter, a receiver, or even complex circuitry out of a radar as his class advances.

That is all very well and good. You have told the student all about it and you have shown him, and we feel this is fine; this is necessary. However, I think most teachers will agree with me that this is not enough, that you will not retain enough of what you have been taught if that is all the farther you go. The next step, of course, is to let the student do it himself, and so we build up a counterpart of this demonstration unit [indicating] in a form now approaching more closely a conventional piece of equipment, with more complicated wiring on the back, but still retaining the capability of having components removed and different or incorrect values or defective components put in. Now you have the opportunity of teaching the scientist or engineer design principles, or you may teach the technician troubleshooting and repair techniques.

All of the circuit parts are available to him. He is able to analyze, troubleshoot, measure all of the circuit parameters, and completely follow in the laboratory everything that the instructor showed him in the demonstration. It is this tying together of all these facets that enables us to make this story stick with the student and has enabled

us to provide, we feel, a better product in a shorter period of time. It is in this that the high schools that have been able to purchase this equipment are in agreement with us.

Mr. ROOSEVELT. Mr. Lewis, you made mention of the fact that only a limited number of high schools had been able to afford this equipment. Is your thought that the Congress should make direct grants to high schools in order to enable them to make the investment in this equipment?

Mr. LEWIS. I am just an engineer working for Philco Corp. I do not feel that it is my position to point out to you gentlemen what should be done. I can only say that we have provided this equipment for our own use, for the use of the Armed Forces in many of their schools and installations, and for a number of high schools that have been able to program it and buy it. The results have been good, and we feel it is worth your consideration. The means of going about it I am afraid are beyond me.

Mr. ELLIOTT. Will the gentleman yield?

Mr. ROOSEVELT. Yes.

Mr. ELLIOTT. What do the schools call this particular course?

Mr. LEWIS. After they have acquired this equipment, they usually call it "Electronics." Their earlier attempts are usually radio repair and then as they become more sophisticated they go into television repair.

Mr. HOLLAND. Will the gentleman yield?

Mr. ELLIOTT. The gentleman from California has the floor.

Mr. ROOSEVELT. I yield.

Mr. HOLLAND. How do you take up your subject or academic courses? Have you talked to Dr. Batey in county schools in Pennsylvania? He is trying to start a school of this type and is trying to tie up an academic course with this training—in other words, the higher mathematics—to show the student how he must know higher mathematics to go into these courses.

In these schools you have now, how do you take up the academic course with this type of course?

Mr. LEWIS. The tie-up into the academic field has been very limited at the present time because of the concept that you will teach so many years of mathematics and so many years of science and so much chemistry and so much physics, and according to the newspapers, it also includes so many years of basket weaving and a few things like that, with the result that there has not been time in the usual curriculums for a separate treatment of electronics.

What some of the schools have been talking to us about, and I do not know of any of them that have instituted this, is working into their physics course some use of this equipment where it is already available to them through a vocation branch of their school.

They recognize the impact that this thing can create and would like to work it in. That is as far as I know.

Mr. HOLLAND. Dr. Batey has an idea of having a technical high school and by bus systems they could take them from the other high schools, the acdemic high schools throughout the county, for say a morning, and then they go back to the academic school for the afternoon and then there would be another class that afternoon, in other words, using this material for double use all the way through.

Is that the way these other schools are working it?

Mr. LEWIS. It sounds like a very good idea in any area where the density of population would permit it.

Mr. HOLLAND. The density is there. If you are going to have a academic course with this, especially higher mathematics, we are supplying it to the Defense Department, Mr. Barden. My nephew is in the Navy and has gone through a lot of schools and they are spending fortunes to teach their boys the same thing that you are teaching here, and then they resign from the Navy and go into private enterprise and get a darned good job.

Mr. KEARNS. The Federal Government could no more go into the purchase of this equipment any more than they could the purchase of textbooks, but I think you will find that there is a type of thing like this in the making. I am glad the Commissioner of Education is here, too, this morning because we will take a high school that has this course going and naturally the boys and girls both with his aptitudes and high I. Q.'s would be quite interested in the challenge of this course.

Would we not in time have those people go directly into industry as technicians where a lot of them would have the ability to go on to colleges and universities to become engineers and scientists? Could we not get overstaffed with so-called technicians and they would not bother going any further because they would be so wrapped up in this type of thing?

Mr. LEWIS. If I may say so, sir, the primary need right now seems to be to motivate more people in this direction and I do not believe that the average youngster who has the capability to go more deeply into this will be satisfied with staying at the technician level.

Mr. KEARNS. That is interesting. I was down in Cincinnati. They have the GE there. They have 2,000 engineers I addressed down there and they just laid 400 of them off. They asked for a little meeting with me after; so I spoke to them. They said, "Should we stay around here now to be reemployed by GE, or should we branch out now to go into some field of electronics rather than waiting for GE to turn over into the missile program from the jet-propulsion program?"

What would they do? They are college graduates, professional engineers, and yet there is no job.

Mr. HOLLAND. Would you yield?

Mr. KEARNS. Yes.

Mr. HOLLAND. A doctor performs an operation. He has a lot of technicians that help him to make that operation a success. What you are doing here is having the technicians who have their place with the well-trained engineer to fill in; is that right?

Mr. LEWIS. That is correct, sir. In addition, it is our very strong feeling that many youngsters who would not otherwise have had electronics brought to their attention will become sufficiently interested in it to go on to the professional level. The reason I feel so strongly that this is the case is that, from the Armed Forces people that we have trained in our school, we have had a number of them stop in and see us when passing through Philadelphia, and bring to our attention the fact that they became interested in electronics through the medium of this Air Force-provided training and had gone on after they were out of the Air Force to obtain their degree.

Mr. HOLLAND. I think it would be a good thing for this committee to visit one of the mills today that has high automation and let them see for themselves the need of technicians taping and the different materials that go through the mill.

I would be very glad to have the Jones & Laughlin Steel Corp. invite you to one of the latest mills in Aliquippa. All a man does there is punch a card and puts it in. He computes it by mathematical formula first. A billet goes in. It comes out a certain depth, a certain width, and a certain length, and that is what the world is coming to.

There is no more man with a strong back needed in the mill. They need technicians. I think your industry is the greatest example of it. Right today in your industry, Philco, I think, is working with about 26 percent of the men who turned out more material than they did before; am I right?

Mr. BOOTH. I am not sure of the percentage.

Mr. HOLLAND. It is close to it, though. I know that one of your competitors is doing it in Chicago—Admiral.

Mr. NICHOLSON. Mr. Chairman——

Mr. ELLIOTT. The gentleman from Massachusetts.

Mr. NICHOLSON. I would like to have you explain what you mean in the last sentence of that chart.

Mr. LEWIS. As I said, I do not feel competent to suggest to this committee the mechanics for going about this, but we know from our discussions with educators that the big stumbling block for most of them in getting this kind of training started in their schools is lack of funds and lack of cross-training for their instructors.

We recommend that some consideration be given to finding ways and means of getting this kind of training started in the many schools that would like to participate in this kind of work, but are unable to do so because of lack of funds.

Mr. NICHOLSON. You have in your outfit a pretty good sized research department.

Mr. LEWIS. Electronics research?

Mr. NICHOLSON. And you give them practical knowledge instead of the theory that they learn in school, physics and so forth.

Mr. LEWIS. I do not believe I quite understand the question, sir.

Mr. NICHOLSON. If you were going to hire somebody, you would probably take somebody from your own organization, would not? I mean, you would not take one of these boys who just graduated from high school?

Mr. LEWIS. It would depend, sir, on the type of job we were going to fit him into. If we were going to put him into one of our research laboratories as a beginner technician, we have hired graduates from the local technical schools—local technical high schools as well as technical institutes. However, as you imply, we do have in-plant training programs and cooperate with the individual in obtaining additional training outside of Philco by subsidy of his tuition and so on to encourage him to obtain further training.

However, if we are looking for a research engineer, we, of course, look to our colleges and universities for those people who are basically trained in that sphere.

Mr. NICHOLSON. Of course, there is one big question here as to whether or not you want the Federal Government to get into the edu-

cational department of the boys and girls in the country and whether the other system has failed or not. Is that not so?

Mr. LEWIS. I do not feel qualified to answer that question, sir. As I say, I am just an engineer working for Philco.

Mr. NICHOLSON. You recommend that we turn it over to the Federal Government?

Mr. LEWIS. No, sir; I do not. That is not what it says. I said we recommend that consideration be given to providing the necessary funds. The mechanics of this, as I say, are beyond me. We also recommend that a Government agency be appointed to handle the administration of this program.

Mr. BOOTH. I might interject here that just before we left Philadelphia—and it was so recent that I could not get copies of it, but we would be very pleased to send copies to the chairman of your committee to add to your references—we received an inquiry I am sure will interest you.

The Oklahoma A. and M. College and their Oklahoma Institute of Technology became interested in adding the Philco training material at their facility. Lacking funds to implement the program, contributions were solicited from alumni and students toward the estimated $2,800 cost for an initial installation. The material was purchased and has been employed most effectively.

Chiefly because of Oklahoma A. and M. College experience, a representative of the Oklahoma State Board of Vocational Education spent several days at our Philadelphia office, studying our methods and suggestions. Since that gentleman returned to Oklahoma, we have been informed he recommended that the State of Oklahoma standardize on our suggested program. A trial program has been authorized by the Oklahoma State Board of Education to use the Philco materials in a 3-year program at Shawnee High School. As funds and details are worked out, the program will be expanded into other schools in the State. The State of Florida has indicated a very direct interest. They had purchased a little material to sort of "guinea-pig," if I might use the expression, just try out and explore, and they wrote us a letter and wanted to know what it would cost to provide assistance for a seminar for instructors from the high school, technical and vocational areas of the high schools in Florida.

We will advise them that if they will establish a time, set aside somewhere between 4 and 8 weeks, depending on the ground they want to cover, but probably an average of 6 weeks, we can give them some assistance and they can take on from there.

Philadelphia is an industrial area with a number of prominent electronic manufacturers, as well as other manufacturers involved with various types of products. You have Philco, RCA, Westinghouse, General Electric, Budd, the aviation factory at the Philadelphia Naval Shipyard, activities at Willow Grove Airbase, and all sorts of industrial activities in which a knowledge of electronics is necessary in order that each industrial concern shall survive and grow.

For instance, Abington High School in suburban Philadelphia is one of the newest and finest equipped schools in our area. With the principal and some of his faculty associates, we explored the idea of starting night-school class for electronics at Abington High School. The class would start at zero, get the basic theory, and develop usable

technical capability in a course that would be factual; teach them a trade, so to speak.

We decided among ourselves that a class of 20 would be required to make a self-liquidating attempt. We have not had enough experience to know what the costs actually are, but as a target a tuition of $200 was established. That took care of textbooks, some of the equipment needed, reimbursement for extra time on the part of the instructors and some miscellaneous items.

They started this fall with a class of 20 and had an overrun. They established a second class. There has been some attrition. I think in the two classes at the present time they are running about 32 or something like that out of the original 40 that started.

Some of those attritions were due to various reasons, inaptitude or health or some other particular condition. However, in this instance local money is being applied at the local level.

I was very much interested in an editorial in the Philadelphia Inquirer recently commenting on the activities in Massachusetts with regard to financing student education on a loan basis to be repaid over a period of time. They have succeeded to such a marked degree that the editorial indicated 16 other States were investigating Massachusetts' experience because they saw the opportunity of financing advanced education particularly for people that were able to help themselves, even though they needed temporary aid.

I do not know how, and I know Mr. Lewis does not know how this problem should be solved. With the thought that this committee has very definitely indicated this morning, I think we are developing an approach to a solution.

A great deal of this problem will be attacked as it becomes recognized at local levels, as indicated at Oklahoma, Kansas, and so forth.

You practically never build a ship now without putting radar on it. New aircraft is carrying radar. Labor unions are interested in taking plant electricians and upgrading them so that they can handle the problems of automation. Electricians want their sons to have a better education than they had, even though they may follow the same trade. The back of a television set looks like a rat's nest as far as the wiring goes, but there is a very simple, easy way of finding what is wrong with it.

The thinking of many educators is that what we need more than anything else in the United States of America is an agreement to do something about this problem. It would be physically impossible for any one organization to undertake a program of this kind to the extent that it should be carried. You are going to need everybody. You are going to need all of the high schools, the technical schools, the colleges, and industry.

I want to say this, because sometimes kaleidoscopic pictures may help you in fathoming some of the things that you are trying to find: Just last week I attended a ceremony at which Mr. Baker, who for 25 years served as principal of the Murrell Dobbins Vocational School, was given an award as the man of the year who had started in a meager way and then made a great contribution.

After the ceremony, the principal, his associate, Mr. Lipp, and Mr. Polan, the gentleman who teaches electronics, wanted us to take a look at the laboratory because we had not seen it for 2 or 3 years, and so I

went over and we talked to Mr. Polan about the advancement of education and especially this need, and I said to him, "By the way, how did you get in this business?" He said, "Well, 10 years ago Mr. Baker thought I had a way with young people and he encouraged me to come down here and work with some of their night classes." He said, "I got interested and he encouraged me to go to the University of Pennsylvania and find out how to teach, take a course in education." He said, "I became intensely interested, and here I am."

I think—and this is just a personal opinion—if anybody is going to really get some benefit from any program he will do better if he contributes something. A few years ago the Air Force sent 50 basic airmen to Philadelphia. They were billeted in the Marine barracks at the Philadelphia Naval Shipyard. They were given access to the hobby shop down there, and they came to our school daily by bus.

Part of the course was a kit of parts to make a simple little radio, but, although Uncle Sam purchased the course and the kit, we very carefully left a few components out of the kit so that the airman, in order to complete it, had to go down to Market Street or Arch Street like a ham radioman and get a part which might have cost him 50 cents, 75 cents, $1, or $1.25.

I do not think any of them paid more than $1.50, but they had to buy something with their own money. They were given the privilege of the hobby shop in the yard so that they could work a little bit at night, and our boys during their lunch hour were willing to take any of them in the laboratories and work with them.

In our training programs where we are upgrading Philco engineers scattered around the world, keeping them in pace with things while they are away, we purposely charge them something for their course and yet they are in our employ. Likewise, if accountants want to advance in their field, if an engineer wants to make a study, if a technical person wants to study at night and head toward an engineering degree, if he will obtain proper marks and goes to a school that the corporation has recognized as reliable, they will share with him the cost of his education, but he pays part of it and we only contribute as an industrial concern to encourage him.

We could not tell your committee where to start or how to start. We just thought it might be helpful if we would give you a little bit of this and a little bit of that, and you would eventually develop a formula by consulting among yourselves and with others, because we are going to need the brains of everybody to make this think come out right.

I think, personally, and this is absolutely personal, that you will find that educators are ready to go. They may have to have some sort of a revolving-fund setup. Maybe they can do it in their own local area. Maybe it can be financed in some way at the local level. Maybe they might feel that the United States Government could help now to give them the pushoff, and yet maybe they would prefer that their own State or their own local area would like to do it.

Anything that comes up in my little community has usually been a community job, and I think that we are very much interested in our taxes, but we are more interested in the future welfare of our young people, and in the Commonwealth of Pennsylvania people are paying school taxes whether they have any children in the school or

not, and whether they have graduated all of their children, they are still backing up the young people.

It will take money. How to get it or who should arrange it, and so forth and so on, I think, gentlemen, you have more powers of observation in more corners of the United States than we have in the little city of Philadelphia, and, if we can tell you the homely incidents, I think that will help.

Let me tell you about two boys in the Panama Canal area. They were strong boys and they helped move some 85 cases of a radar set. They opened them. They began sorting out the base plates and some of the structural parts. Their enlistment ran out just about the time they had the upper platform assembled, and the boys went to the company commander and said they were learning so much that they would reenlist if they could stay in the outfit and finish that particular piece of equipment.

Naturally, the company commander made that free and easy and the boys saw that equipment finished. They had a pride in it which became kind of personal. With their own money they bought the Philco technical representative field engineer two shirts and a wristwatch as a repayment for the encouragement that he gave them.

When I was at one of the remote sites just outside of Harmon Field, I met a technical sergeant who had reenlisted the hard way. They would not reenlist him in New York to go back to that particular outfit. They would not do it in Boston. He thumbed his way up to the boat. He paid his fare across to Newfoundland and he got back to Harmon and his old company commander was very glad to reenlist him. He wanted to get back in the very area with the thing that he had worked with and learned so much about. I do not know, but I think that man will be a career man in electronics. I know his fingers are going to guide a number of young men that will pass through his hands.

How we do it, the way we do it, or where the money comes from, gentlemen, we will leave that to your committee, because I think that any decision that you make will be the best decision for the entire United States.

However, I think we can do better, not by telling you what to do, but tell you what has happened, or what is happening, and what the trend is. We could not tell you who needs money or how they should ask for it.

Mr. ELLIOTT. Chairman Barden?

Mr. BARDEN. I have no questions. I thank the gentlemen.

Mr. ELLIOTT. The gentleman from Kentucky.

Mr. PERKINS. I have no questions, Mr. Chairman. I am delighted that these witnesses were requested to appear here today, because I feel that the testimony has been very much worthwhile. It gets us back to the high-school curriculum, and, of course, I personally feel that we should authorize the expenditure of some money for the purposes that have been discussed by the witnesses here this morning and, perhaps, do it on a matching basis to afford the inducement for the high schools at the county level, and then, of course, that will bring up the problem at the local level, in order to qualify for the matching, that they must rearrange their curriculum and so forth. I think the testimony has been very helpful, Mr. Chairman.

Mr. ELLIOTT. The gentleman from Georgia.

Mr. LANDRUM. Mr. Chairman, I have only this comment: That I feel the material presented here this morning provides some real food for thought. I am delighted to have had the opportunity to listen to all of the gentlemen, particularly the specific presentation of Mr. Lewis.

Mr. ELLIOTT. The gentleman from South Dakota.

Mr. MCGOVERN. Mr. Lewis, if we were going to add one new technical course to the high-school curriculum, presumably to strengthen modern technology, would electronics be the best course to add?

Mr. LEWIS. Of course, you are asking a prejudiced person because I am an electronics engineer. However, I feel that electronics has become part and parcel of almost every other engineering field.

For example, the chemical engineer in a petroleum processing plant has to know electronics to appreciate the automatic controls that are being incorporated into the latest refineries. I believe it was Mr. Holland that pointed out the extent of the use of automation, which means electronics, in the steel mills.

Almost any engineering field now must know electronics to some extent and for that reason I feel that it would be a very worthwhile addition to every high-school curriculum.

Mr. MCGOVERN. Since presumably we are going to be faced with the problem of money when we start talking about improving our educational program, if it came to a choice between adding technical courses such as electronics to the high-school curriculum or allocating additional funds to improving the general level of our instruction in physics, chemistry and mathematics, and in fact all basic subjects, which do you think would be the best investment of the taxpayers' money in terms of our overall national interest?

Mr. LEWIS. When I say I recommend the addition of electronics as a course, I am also contemplating there that you are going to bolster the teaching staff, perhaps by as simple a program as we have outlined here, perhaps something more basic. I do not think you can do one to the exclusion of the other.

Mr. MCGOVERN. However, you would not suggest if a school is operating on a limited budget and with limited assistance from outside sources that it miss an opportunity to strengthen the overall curriculum and the quality of courses in other areas simply to meet this technical problem that we have facing us today?

Mr. LEWIS. I have read a great deal of some pretty competent authorities in the educational field which leads me to believe that the majority of our high schools have courses in their curriculum on which they are spending money which could very well be dropped without hurting anybody's feelings except perhaps the educators who are advocating that particular subject.

Mr. MCGOVERN. I have been wondering in my own mind if possibly training in the field of electronics and other technical fields might be incorporated simply as one unit in the physics program. I think that is being done in most high schools now. They probably are not doing as good a job as we would like, but possibly with the use of the program that you spell out here this could be tied in as a part of the physics program rather than making it a separate course.

Do you think that enough material could be taught, let us say, in a fifth, or a fourth, or a third, or whatever it might be, of the physics program to be profitable?

Mr. LEWIS. As a personal opinion, I do not think so, and I feel from my own investigation of existing curriculums in my own neighborhood that there is plenty of room on the existing high school program timewise to afford a proper study of electronics, and I feel that it would have a tremendous impact collaterally on the other fields, mathematics, science, physics, and so on, because it is so interwoven with those that they would be mutually beneficial.

Mr. MCGOVERN. Maybe this question will ask you to go a little bit beyond your field, but you were telling us that approximately two dozen high schools now have the kind of program that you have mapped out here today.

Would you say that the basic factor in limiting it to that number of high schools to date has been the financial factor? Is that the reason more schools have not gone into it?

Mr. LEWIS. I would say so; yes, sir. Generally speaking, the only ones who have been able to incorporate this have been the new schools where funding is being carried out for the whole thing at one time and where it is possible to slide this $25,000 figure into a $2 million budget, just to pull some figures out of thin air.

Where a school board must decide to spend $25,000 as a separate item in their current expenses, it is pretty hard for the science teacher or the principal to sell the school board.

Mr. MCGOVERN. I want to join with my colleagues in thanking you for your statement and also your answers.

Mr. ELLIOTT. The gentleman from New York, Mr. Gwinn.

Mr. GWINN. Mr. Lewis, I take it that when you said you thought education could show a better utilization of the human materials we have, you meant instructing the boys and girls in these new opportunities and sloughing off possibly other studies that are not quite so rewarding and for which there is not so great a demand?

Mr. LEWIS. I am sure that these are not my sentiments alone. I brought with me a text of a Philadelphia Bulletin forum which was on TV a number of weeks ago and the bulletin was kind enough to lend me their only transcript from their files.

The participants in that forum were Alexander G. Korol from MIT; Dr. Harnwell, president of the University of Pennsylvania; Dr. Walker, president of Pennsylvania State University; and Brother Stanislaus, president of LaSalle College, and I am sure that the committee would find this transcript of interest in that these "ivory tower," shall we say, representatives are all pretty much in agreement that the high schools are wasting time on subjects that they should not be bothering with and not devoting an adequate amount of time to the sciences, and mathematics, and foreign languages, and so forth, the things that are needed as basic training for the science and engineering fields.

Mr. GWINN. What do you pay a good, bright high school boy that comes out of an electronics class?

Mr. LEWIS. I am not qualified to answer that, sir.

Mr. GWINN. When you take on a young technician, how much do you pay him per year, about?

Mr. LEWIS. I am afraid I could not answer that. It is out of my bailiwick.

Mr. GWINN. If there is the demand for this type of training that you speak of, what is a better way of communicating that to the young high school student and to his teacher and parents than to let it be known that there is a demand? Will he not respond to that demand?

Mr. LEWIS. If I may have a moment, I think I can find a quote in here from one of the four people I just mentioned. Perhaps I can paraphrase it by saying that too few of our young people are afforded a direct contact with people in the engineering and scientific world. Too little publicity is given in our usual mediums, the papers, TV, and so forth—that is, until just recently—on the opportunities in the engineering field, and this is one of the big reasons, as these gentlemen point out, that we have had too few people preparing themselves for the engineering and scientific fields.

Mr. GWINN. If the local community or the local high school does not respond to an obvious demand, there is nothing the Federal Government can do about that that you can see, is there?

Mr. LEWIS. I think whether it is the Federal Government or who it is, there is a great deal being done right now in the way of needed publicity which is going to help.

Mr. GWINN. That is coming now through your own publicity, for example.

If the high schools are not wide awake enough to see these possibilities for their students, then private individuals are likely to come along and start private schools to fill this need, are they not?

Mr. LEWIS. This is a possibility.

Mr. GWINN. It is actually happening to some extent, is it not?

Mr. LEWIS. The growth of these private schools, sir, I do not have any direct information on. I know that they exist and that they do make an important contribution to what I call our technical manpower pool, but their contribution is still far short of what it should be to meet this "two-technician-for-one-engineer" requirement.

Mr. GWIN. Is Philco at this moment short of technicians?

Mr. BOOTH. I do not think they are right at this particular moment, but if business goes back to where it was a little while ago they may be. They are always having something developing; I mean new things or modifications of things that have been in current manufacture.

When they come into effect, then production lines start going and activities pick up. It is very hard to try to connect this idea and this programing and this planning to day-by-day business. It would be very false if we tried to do it.

Who would have thought that we would have to "pick ourselves up by the bootstraps" a few years ago, place people in uniform, and in a matter of 30 weeks teach them something that could have been accomplished in a high school if we had planned in advance of the need.

Mr. GWINN. You have no real suggestion for us that would induce us to depart from the free market, do you, Mr. Booth? Is there any better or closer measure of demand and supply than the free market which we are now operating with more or less success?

Mr. BOOTH. I think the free market is the right way to do it.

Mr. GWINN. There is not any doubt that you convey to the young people and to the teachers and parents the story you conveyed to us, that out of the American system of education you think you get responses you need, do you not?

Mr. BOOTH. We hope so. However, we still have students who find it necessary or desirable to continue their studies at post high school commercial, technical institutes in order to qualify for technical types of work.

It would be nice if all of the gentlemen wearing the ROTC uniform in college already had some practical know-how. Generally mechanical engineers have to learn about diesels after they get an assignment in the service.

Electrical engineers have to go to Fort Monmouth to get practical schooling in electronics. In the past graduate engineers entering industry worked with "bolts and nuts" on the bench, way below their intelligence, because they had not learned what made a radio work. They had to learn the hard way.

Some boys with incentive became "hams" or worked on the radio station in their college or university and when they came to Philco they were way up because of that practical experience. They had unusual opportunities presented to them because of that fact.

Mr. ELLIOTT. Speaking on behalf of the committee, we are very grateful to you, Mr. Booth, and to you, Mr. Lewis, and to you, Colonel Knighton, for this fine presentation which you have given us. We appreciate your kindness and your courtesy very much.

The committee will meet at 10 o'clock tomorrow. The witness will be Dr. Lawrence Derthick, who will resume his testimony which unfortunately was interrupted some few days ago.

Following yesterday's proceedings, without objection, the statement of the gentleman from Massachusetts, Mr. Thomas J. Lane, will be inserted in the record following the proceedings as the reporter now has them.

Mr. Lane's statement is on his bill, H. R. 8571, to provide Federal insurance for loans made to science and engineering students for tuition.

The committee will stand adjourned until 10 o'clock tomorrow.

(Whereupon, at 12:30 p. m., the committee recessed, to reconvene at 10 a. m., Wednesday, February 19, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

THURSDAY, FEBRUARY 20, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION
AND SUBCOMMITTEE ON GENERAL EDUCATION,
COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10 a. m., in room 429, Old House Office Building, Hon. Cleveland M. Bailey presiding.

Present: (Subcommittee on General Education) Representatives Bailey (chairman), Gwinn, and Frelinghuysen; (Subcommittee on Special Education) Representatives Green and Wainwright.

Staff members present: Charles M. Ryan, general counsel; Mary P. Allen, clerk (Subcommittee on Special Education); and Robert McCord, clerk (Subcommittee on General Education).

Mr. BAILEY. The subcommittee will be in order.

It is to be regretted that the regular chairman of this committee is not available for presiding over this morning's meeting. It was necessary for him to make a hurried trip to his home State of Alabama, and he has asked me to sit in as chairman of the subcommittee.

We have listed as a witness this morning, Mr. Rodger Over of Up 'N Atom Enterprises, of Inglewood, Calif., and Mr. Over is accompanied by Mr. Carlisle Stevens, director of the Stevens Enterprises, Inglewood, Calif.

You gentlemen may further identify yourselves to the reporter and proceed with your testimony.

STATEMENTS OF RODGER OVER, UP 'N ATOM ENTERPRISES, INGLEWOOD, CALIF.; AND CARLISLE STEVENS, DIRECTOR, STEVENS ENTERPRISES, INGLEWOOD, CALIF.

Mr. OVER. Thank you very much, sir.

This is Mr. Carlisle Stevens, who is the director of Stevens Enterprises and Up 'N Atom Enterprises. We are located at 503 East Hyde Park, Inglewood, Calif.

My name is C. H. Rodger Over, and I am an engineer and educational coordinator, and consult and coordinate for both organizations.

Stevens Enterprises is largely concerned with the construction and demonstration and manipulation of special science fiction and science fiction effects for the motion picture industry and other industries.

We also manufacture computer training aids, audiovisual training aids, and devices for controlling the flow of human traffic. More or less as a suborganization, Up 'N Atom was formed in order to create an assembly program that could be presented to schools, particularly

in our area in the beginning, in order to create an interest in the field of science.

In other words, we felt that science itself in the schools, sometimes in elementary courses, appears to be a rather dry subject, dealing a lot with theory and mathematics and so forth, and many people in the early years in school are more or less steered away from this field. So we thought perhaps in a sense we could dramatize to a certain extent the exciting end, and we created this original program, which was so successful in the first tour, and, incidentally, reached about 250,000 schoolchildren, that in the second year we had to add two more programs.

That was last year. We had 3 programs on the road reaching over 900,000 students. This year we have five programs on the road and again this is in demand.

As a result of demand by schools over the country, it is actually in 21 States now, reaching over 1,687,500 children.

Presently we are obligated by contract to provide next year 8 programs to go into 45 different States in over 4,000 schools and it will be seen by more than 3 million schoolchildren. This is both elementary and high school.

As the program is established at the present time the schools pay for each presentation. The amount differs in each area. It depends upon the area where the school is located and the agency that books the program for us. We do not book our own programs. They are booked through regular standard booking agencies who have been doing this for years—the National School Assemblies in one area, and the University of Kansas Bureau of Concert and Lecture Artists in another area.

We found it not economical for us to book our own programs, but that it is cheaper to pay these people a small commission for doing this.

Mr. WAINWRIGHT. Is this a one-shot deal?

Mr. OVER. Yes, it is a regular tour. The man on the road receives a list of where he is going and he follows it right straight through and goes in whichever direction they happen to be sending him.

Mr. WAINWRIGHT. In other words, you do not sell a display operation that stays permanently in that school?

Mr. OVER. No, sir. I think we should stress this because this is one of the important factors with us: They are not intended to be science education courses. We are not trying to teach science in an hour's assembly program on a stage.

We do not think this can be done in an hour or a day, or even a week for that matter, because there are too many other ramifications involved.

What we are attempting to do is to show these students things that science has produced—new things that are just out, new developments, new gadgets, and so forth—in a manner as exciting as possible so their interest is stimulated and they will want to continue in the field.

We do not stop there. We actually answer somewhere in the neighborhood of over 400 letters a week. This varies back and forth, depending on the schools.

We do not encourage the children to write, but they do. The reason we do not is because we are not at the present time able to handle any more correspondence than we have now, but they do write asking

for information on the construction of various devices we have in the program, ideas for science fairs, school projects, and that sort of thing, and we try to cooperate as much as it is possible for us to do this.

We also make available kits for the construction of gadgets and devices that have a practical value that are not readily available now, or if they are available, they are so expensive that they are prohibitive, and I can cite as an example this little unit which we have on the table.

It does not look like very much, but actually this is a radio. This is a transistorized solar battery radio. We put out this unit in parts with the complete set of plans.

In addition to sending the plans, we send them a pictorial, a picture of each little part that relates to a schematic. As you know, schematics are a little hard to read, if you are not familiar with the way they are designed.

Our pictorial relates to the schematics so that in a sense the schoolchildren actually have to learn to read a schematic before this can be constructed, but it is not so difficult.

This little unit utilizes components that are actually being used today in the satellites; the solar battery, and the transistor, and we relate to this type of thing in our material that we send out. We make these things available at what amounts to practically cost to us; cost plus a few cents for handling and postage and that sort of thing.

We also have another unit that we make available which is a construction kit for building a theremin, which is an electronic device that could be called a musical instrument in that it is played with the hands. But the operator does not touch the unit.

One antenna on one side controls the pitch of the sound and the other side controls volume. Before last September there were not too many of these units in the country and we put a program on the road this year in 1 area covering 4 States where there are 40 of these things being constructed right now as a result of the program by schools and by children, to be used in fairs and that sort of thing.

It has a very practical value actually in many areas for studying sound, and capacitance, and that sort of thing. This more or less covers sheet 1 which we have down here.

One of the things that I did not mention is the manner of financing and that is that the schools themselves pay for the program, but this amount varies from $22 or some to about $35 per school, depending upon the area that we are in. This is just about tops as to what these schools are able to pay for these programs, and of course we do not get that much out of the money that comes in.

We average about $22 a program, and, as a result, we have to subsidize the balance of the cost of the program ourself, which is about one-third more. With one program this was not a problem, and we, willing, did this.

With three programs it began to become a problem. With 5 it is a very definite problem now, and with 8 programs next year, we will not be able to continue unless we find some sort of support.

Mr. WAINWRIGHT. Why do you not sell these things like that sound transistor instrument that you showed? You are not in this for charity.

Mr. OVER. If we make them too expensive or if we add a profit to these little units, then many of the children cannot afford them. As

it is, this little unit sells for about $9 and $9 to school age is a lot of money to a schoolchild.

The theremin unit averages about $38 for all the parts of it and this is a tremendous amount of money. We do not sell enough of them to make a difference on the cost of the program to begin with. We would have to sell thousands of these things in order to make a difference, so we would rather have more of these units available to schoolchildren to try to make a profit off of this.

In fact, we buy in such quantity that we can sell them as cheaply as we can. These little units, for instance, made in this country, sell for about $7.95.

We made contact with a company in Japan which sells us a comparably good unit for about $2.95, so this allows us to put this out that much cheaper.

We are not trying to compete with an industry that is selling any parts or kits. We do not sell a kit which is already being constructed or being sold.

Mr. BAILEY. I am somewhat disappointed to know that you are taking advantage of cheap Japanese imports to put on this program. I am opposed to the idea.

Mr. OVER. Sir, actually it is a California company that is doing the importing, the Calrad Corp., so in a sense we are dealing with one of our own. But if we did not do that, these units probably would not be made available.

As it is, we do the best we can on the price. That is the only reason we did it. We made that one concession for that purpose. The rest of the material is all made in this country, the transistors and all the other parts, the major part of the cost.

On page 2 we more or less express what we would like the Government to undertake so that we could continue to present these programs.

I have made the rounds of a number of people here in Washington who would be primarily concerned with this type of thing. I will get this out and I can give you their names in just a second.

At any rate, I have discussed the program in its entirety with these various people who have been indicated to me as being responsible parties in the school program area of one sort or another in education.

Their response up to this point, at least to me, has been very favorable. I discussed this subject with Mr. Homer Babbidge, who is assistant to Secretary Folsom in the Department of Health, Education, and Welfare.

Mr. Babbidge appeared to be very interested in this and indicated to me that he felt that this type of program was well worth continuing.

I discussed the subject with Dr. Ellsworth S. Obourn, who is the Director of Science Education in Health, Education, and Welfare, and Dr. Obourn appeared very favorably impressed.

I discussed it with Dr. Frank Dunham, who is Chief of Radio and Television, in Health, Education, and Welfare, and Dr. Dunham was very interested in the program.

I also went outside of HEW to discuss it with Mr. Howard Foncannon, who is the assistant to Dr. Kelly in the National Science Foundation, and he was favorably impressed. He suggested to us that there was a possibility that the National Science Foundation could finance a program such as this, if we had the sponsorship of a nonprofit organization.

We can have this. There is an organization that we are very closely connected with in California called the Future Engineers of America, which, I think, would be happy to sponsor these programs.

That only makes us eligible for a grant from the National Science Foundation and this is assuming that they have the funds available for this sort of think. So it does not mean we would get it actually simply by getting their sponsorship.

I also discussed it with Dr. Philip Hemily, who is the program director for the Academic Year Institute for the National Science Foundation, and Dr. Arthur Kenny and they were favorably impressed.

There are a number of others. Would you care for me to list them now?

Mr. BAILEY. You might offer them for inclusion in the record.

Mr. OVER. I talked to Mr. Watson Davis, who is the director of Science Service, which is located here in Washington, and this is a nonprofit organization devoted to disseminating information in the field of science. Their address is 1719 N Street. Mr. Davis felt that these programs were of considerable value, according to the information I got from him.

I talked to Mr. Davis Purseglove, who is assistant editor of Chemistry magazine for Science Service, and he said this was something that was very definitely a necessity.

I talked to Mr. Joseph Kraus, who is the coordinator of the national science fairs, and he suggested to us that we perhaps would be able to utilize some of our programs during the summer in the national science fair program, that is, going out to some of the institutions who have grants for the purpose of presenting summer programs.

Mrs. Margaret E. Peterson, who is the executive secretary of the Science Clubs of America, also was favorable to the program.

These are the people who were in various positions dealing with science that I discussed it with. There are a number of people who have administrative or legislative positions that we discussed it with, and they seemed to be impressed also. I could mention their names quickly, if you want them.

Mr. George Mahon has been very helpful to us, and he seemed to be very interested in the program. I talked to Mr. Charles McWhorter, who is legislative assistant to Vice President Nixon, and he said that he felt that the programs had value and he was the one who recommended me to the National Science Foundation; that is, made reference for us.

I talked to Mr. George Miller in the House of Representatives, and he was very interested. Mr. Jimmy Roosevelt is from our area, and I discussed it with him and he seemed impressed.

I talked with Mr. Paul E. Manolis, who is administrative assistant to Senator Knowland, who is from our State, and he attempted to help me as much as he could, as well as Mr. Merrell Small, who is the administrative assistant to Senator Thomas Kuchel.

That is more or less the group that we have presented this to so far, and, in each instance, we have not been discouraged. Everyone has said that this is well worthwhile.

We will go on now with my suggestion as to how this might be handled.

This is something, of course, which is a legislative thing, and we are not too familiar with this but we felt that perhaps, according to

the bills as I have read them, in each case they suggest very strongly the stimulation and the interest in the field of science, but nowhere in either bill is there any mention made from the standpoint of actual physical stimulation initially.

These bills apparently are wonderful, and I am just sorry one of them was not passed when I was going to school. I think I could have gone farther.

At any rate, they suggest the idea of encouraging those people who already have an interest in the field of science to continue in this area by financing and that sort of thing, but nothing is stated about an initial stimulation of interest in the elementary schools and the high schools where many of these people choose a life career or decide on what future they are going to have.

We found this to be true in many of the schools we have been in. We did not conduct a survey on this, but we have found this information: Often the science teachers would come to us when we were presenting a program and say, "We have the facilities for a good science class in chemistry or in physics, but we only have 5 people or 6 people interested in it in the class and we will not have them again next year" and, partially, this is due to the fact that the original stimulation or excitement about the field itself is not there.

The student does not see the scientist as interesting a person as the policeman, the lawyer, the doctor, the teacher, or some in other fields. So they have asked us repeatedly how we might help them make their particular course more exciting.

In a way, we are able to cooperate. Of course, our programs do this because after one of our programs is complete the interest in science is at a peak. We attempt to follow this up by leaving material concerning the program itself behind for the student and for the instructor and we would like, if we can get sponsorship and continue the programs, to send out a monthly newspaper which would go to all the students who would write in for it, and all the schools, explaining projects of other schools that are conducting various projects, an interchange of ideas.

We have a number of the 10 best questions of the month and that sort of thing. In other words, it would be a comprehensive stimulant to continue an interest in this field.

The suggestion made in here is that the Government set aside a certain amount of funds each year to be administered by whomever would be the proper party, the Department of Education or others, through perhaps the National Science Foundation or someone else for the purpose of hiring private agencies to conduct these programs.

By private agency I suggest, of course, naturally, ourselves, because I think we can safely say that we conduct our programs more economically on the whole than any other program being conducted in the field like this today.

There are a number of sponsored programs on the road, none of them duplicating what we are doing, and all of them very important, but, at the same time, the cost of operation for them, according to their own figures, is about 25 cents per child, per impression, and they feel that this is rather economical.

We are able to do the same programs with more material at a cost of about 4 cents per child. This would require for us the subsidization of about 1½ cents per child within the schools.

There is a good argument for not actually supporting these programs, and I think that these two points should be made: One, when a school has to pay for a program themselves they are very particular about what they get, the type of quality and what the program covers, and their utilization of it.

We hear very drastically and very rapidly any comment about a program that we might present that is not actually what the school feels it should be, and our record of this sort of thing is very high. In other words, we have very few complaints.

That is one point why the program should be partially supported by the schools.

Another is that since the schools are already doing this up to a point, it would seem rather wrong in a sense to completely sponsor or subsidize these programs because this same money might be very useful somewhere else in some other field of stimulating interest in this area.

The cost of supporting the 8 programs we have scheduled for next year probably will not run in excess of about $39,000 or $40,000 for 8 programs to travel through 45 States to do over 4,000 shows in 4,000 different schools to over 3 million schoolchildren, figuring less than a cent and a half per child.

We suggest that if this sort of thing is established, the contracting company that takes these programs or that bids or contracts for these programs through NSF or someone else should be capable of presenting them at least as economically and as thoroughly as we are now doing.

They should be doing at least a minimum of 2 programs per day, not less than probably 12 programs per week. We do more than this, actually. We average 15 to 17 shows per week per unit, depending, of course, on weather and school holidays and that sort of thing.

We do about 450 shows a year with each program on the road. There are other organizations doing programs, but no one of them that we know of does more than one program a day.

There is one completely sponsored group from the AEC and the National Scientific Foundation. They have seven programs in a row called the Traveling Science Teacher. This individual goes into a school and does one program a day for a small group of students, and this is a very valuable thing because I think they are working them with a nucleus group and they are teaching science for a short period of time.

We are not pretending to teach science. We are trying to create interest. Everyone that I have spoken to in the educational department felt that these two programs would not conflict in any way at all, but one would complement the other in this respect:

If our program followed the Traveling Science Teacher into some school, we would simply be adding to the interest in this particular field. It is unlikely that they would because we will only cover next year about 4,000 schools and I think this AEC program is only covering about 200. So, if we did cross paths some place, it would not be more than 200 times.

We would like to also see that the organization that undertakes a project like this be required to put out a monthly publication to schools dealing with science and so forth.

In other words, it is not just merely a case of presenting a program. The company should be responsible to follow it up and try to continue and create stimulation of interest in this field. They should encourage the formation of science clubs within the school, affiliated with the science service or the science clubs of America and this sort of thing.

As it is, we are doing the equivalent of putting out a paper by simply answering all the letters that we do answer.

I refer to the third page in this first section, which is simply quoted material that we pulled out that we thought you might be interested in, quoted from the Council for Technological Advance, trying to indicate a need for some sort of stimulation in this field, as, of course, you are already aware.

They quoted engineering schools as saying that 60 to 70 percent of the students that they get cannot carry college courses without repeating or taking mathematics and science courses that they should take in the high school before they can go on.

They state that 37 percent of the American high school students take geometry and less than 65 percent take algebra, while every graduate of a Russian high school has taken mathematics through trigonometry.

They also stated in this report that only 32 percent of American high school students take chemistry and only a few take it for more than 1 year.

This is something which we have found in the schools; the science teachers tell us that in many cases they have the facilities available and that it is not a question in many areas of a lack of facilities. This is something, of course, we have heard a great deal about today; that schools are inadequate, that teachers are inadequate, and many of the schools tell us that they are only inadequate because there has been no demand for them to be adequate from the students themselves or from the families of the students, but if the interest was there, that they have the facilities to provide these things.

They often have chemistry teachers teaching history part time because there are not enough students taking chemistry to keep them employed full time.

The same report stated that every Russian graduate had 4 years of chemistry. They, at the same time, say 76 percent of American high school students have had no physics at all and every Russian student graduating from high school has had 5 years of physics.

If there is any real question as to why in some areas we are behind academically, I think this can be attributed to some of these facts within the high schools themselves, because I can tell you by personal experience, from teaching at San Jose State College in California and we ran into so many students that had to repeat or make up courses that they should have gotten in high school, that they had to set up numerous separate elementary courses in the college, which they referred to as bonehead mathematics and bonehead English, and these other things which they should have taken in high schools.

They had to repeat them in college. This means that a lot of these people spend their first year simply attempting to qualify to go on at a college level. There even are courses that have required these people to learn how to read well enough to take college courses, and

this sort of thing, of course, is unfortunate, but the fact that the colleges provide these facilities is encouraging because at least these people get to go and follow a college career.

Mr. BAILEY. The Chair would like to interrupt at this point. I believe a year or so ago the University of Maryland issued a statement saying that 37 percent of the students who applied for admission to engineering and similar courses were unable to meet the requirement for entrance at the university because of their inadequate high school training.

Mr. OVER. Yes, sir. Of course I was very interested in education and that is the reason I was working as a teacher, but one of the major problems that we found was that during the high school years many of these people had no idea what career they wanted to pursue in college.

When they got to college they still had no idea what career they wanted to pursue. They would have a slight interest in the field of science or maybe in the field of business or something, but they thought they would stay in college a couple of years and then choose a major.

Of course most of the colleges frown upon this sort of thing. They would like to have people know what they are coming to college for, but they do not make an issue out of it and many people do spend a year or a couple of years in their college education before they decide on a major, and then they have to spend an extra year or two following the regular 4-year program in order to make up all of the things they should have taken the first 2 years.

We are not trying to cure the ills of education because this is a tremendous job, much larger than our little company, but we suggest this:

We would like to feel that as a result of our stimulation of interest in the field of science we would at least have a few people who, during their high school career, would have chosen science or have decided upon a science as a major to follow, and during the high school career be preparing for this.

We would like to do in our paper several things which the high schools are very lax on, simply because there is no organization in this area.

We would like to choose a career person in science, somebody who is already successful in a particular field, in industry we will say, as an electronics engineer or an engineering chemist, or something in this field, and we would do a background story of what was required for this person to achieve the position he now has.

We would evaluate the type of job opportunities that we know of—and I might interject that we are in an excellent position to do this sort of thing at very little extra cost to ourselves because the nature of our other business requires us to keep tabs on research and developments constantly. We spend a great deal of time simply making the rounds of research laboratories where we are known so that we may keep track of the newest things that are being developed.

We also do a small amonut of research ourselves in specialized areas. We are located in more or less an industrial area of a great deal of of research and development and this keeps us more in contact, I think, than perhaps someone located here, for instance, because we are able

to go right into these laboratories in the Los Angeles area and study what is going on, and we also have very excellent relationships with the colleges and the universities in all the area around San Francisco and the peninsula, which is largely electronic today.

At any rate, we would like to follow a career each time. We would like to make a list of schools that are particularly well equipped to give a major in a particular field of science, as some schools are and some are not, as you know, and we would also like to get their requirements and the things that they should do while in high school in order to be ready to go the minute they hit the particular college they choose.

We would also like to compile and try to keep a list of scholarships available in this particular field, which we would add from time to time to this publication as it went out.

We want to do everything we can in this particular thing to encourage these people to pursue a career in the field of science.

Naturally someone is going to ask what is our motive in doing this sort of thing. We have two I think. We are not selling a product. We do not manufacture automobiles, or electric lights, or anything like that that these schoolchildren are going to buy.

In fact, in many of the areas they do not know our program is called Up 'N Atom because it is booked as the University of Kansas lyceum service science programs and booked in another area as Through the Science Barrier. So as a result, the name Up 'N Atom is less well-known to the schoolchildren than it is to many of the people on the faculty who know what program they are booking.

We have no gimmick from the standpoint of selling to these people. At the onset most of us have been interested in education in one form or another, and when you like this work and you cannot do the full time, often you try to supplement it in some other way and this is one method of doing this.

If these programs are subsidized to the extent that we have suggested we are not going to make any great, vast amount of money off of them, I can assure you of that. We will probably, according to the figures that we have worked up, break even with just a little to spare in the event of some sort of an emergency, which happens to us, as Mr. Stevens just reported to me when I got out here this time.

A couple of our units on the road had accidents and breakdowns as a result of the bad weather, and just this week we have expended almost $1,000 in expenses just to keep these units going.

So far we have been very lucky. We have had very few cancellations. We hardly ever cancel a show. The schools sometimes do during the flu epidemic and that sort of thing.

We try to maintain as many programs as conceivably possible for us to do. It is hard for us to understand how fully subsidized agencies can feel they are earning their money if they do one program a day and they are exhausted at the completion of this, because we feel these programs can be done at least three a day if they are handled properly and set up properly.

Our shows are very compact, and we will show you that later. We can be at school 15 minutes before a program and by program time it is ready to go. Ten minutes after the show, if it is necessary, we can be back on the road again.

It is a rolling unit which goes in, is unpacked, the show is presented, and out it goes again. If we have more time, then the individual who conducted the program stays behind and discusses the program, and answers questions, and that sort of thing, which is usually the case.

I would like to go on to page 5 on this and we have a list here of reasons why we would like subsidization of some sort or we would like to have support of some sort.

I hesitate to use the word "subsidization" because I know this has been maltreated, but this lists more or less what we have in mind to present science demonstrations of such a nature and at a level to appeal to all persons. But primarily we are trying to interest people between 8 and 18 years of age.

We want to create an interest in the field of science as a career. We want to foster the continuation of this interest in the science field, and we want to form and cooperate with Science Service or someone a National Junior Scientist Club of some sort, which will be continued within the schools.

There are 17,000 assorted science clubs in the country affiliated with Science Service.

Mr. BAILEY. Will you allow me to interrupt?

Mr. OVER. Yes, sir.

Mr. BAILEY. That brings us to a point directly concerning the committee. We have legislation pending here by a Member of Congress and I was interested in your mentioning in the preliminary statement about the future engineers and an organization there in California.

This Member of Congress has approached a Federal charter for the Future Scientists of America, modeled somewhat on the plan and charter granted to the Future Farmers of America.

Do you see any possibility in a national organization of that kind?

Mr. OVER. Tremendous possibilities.

Mr. BAILEY. Tell us a little something about that engineering group.

Mr. OVER. I would like to have Mr. Stevens answer this. He is the vice president of Future Engineers of America and perhaps he can give you the information.

Mr. STEVENS. The organization was formed slightly before actually the Future Scientists of America and it is doing exactly the same thing. It has been entertained that we merge together and form the Future Engineers and Scientists of America or Future Scientists and Engineers, depending on how it works out.

Mr. BAILEY. Are you functioning outside of the State of California?

Mr. STEVENS. To some extent, but not too much. There is not too much in the way of population outside of the State of California immediately.

In other words, there are long distances and a small amount of people, so we have not been able to spread out as of yet easily, but we intend to do this.

We have an affiliation with the Jet Clubs. You may be familiar with the Junior Engineers and Technicians, I believe, clubs that are sponsored by the University of Michigan.

They work throughout the States of Illinois, Ohio, and all around the Great Lakes area, and this is very expensive and they are doing a very good job, and they also actually have a few clubs as far as Texas. But they are also doing essentially the same thing as the Future Scientists of America.

They put out a monthly bulletin to their clubs, and they conduct science fairs and they give awards and prizes for the best project produced by the kids, and in general it is working out very well.

Mr. BAILEY. Do they carry on demonstration projects like the Future Farmers?

Mr. STEVENS. To some extent; not as great as the Future Farmers.

Mr. BAILEY. Would that not be a major objective?

Mr. STEVENS. This should, I believe, be a major objective of an organization like this, but they have been under the same problem that all of these clubs, the Future Engineers, the Future Scientists, and all of us, have been under, the financial burden of doing this properly.

The Jet Clubs have just received very considerable sponsorship from the local power companies there in their State. So they are doing quite well now and they are beginning to expand in this direction.

Mr. BAILEY. I do not think you would have any difficulty if the Congress gave national recognition to an organization of that kind. You would have no difficulty in getting sponsorship.

Mr. STEVENS. It would be a wonderful thing.

Mr. BAILEY. I just wanted your reaction to the proposal because I expect to open hearings on the proposal shortly in the other subcommittee.

Mr. STEVENS. I would like to say in view of this that this is something that is needed desperately right now, something to bring these kids together and give science some prestige, make them think that to belong to this club is worth something to them from the standpoint that they will be looked up to by the other members of the school. This is the genuine idea of a club of this nature.

Mr. BAILEY. One thought I had in mind in particular was the benefits that might accrue from an organization of that kind. It would take you into the type of high school that is not touched by the Future Farmers of America because their activities are confined largely to our agricultural high schools and areas in which the major part of the students come from agricultural areas.

It would take you into our industrial and metropolitan high schools where there is so much juvenile delinquency. It would give them something to take their minds off of just pure cussedness and give them something worth while, and I think that would be the major benefit accruing from an organization of that kind.

Mr. STEVENS. It would give them something to join and work toward.

Mr. BAILEY. If a young farm boy can set up a calf program, or a lamb program, or would have a plot of ground to grow strawberries on, or what have you, in these industrial high schools, there is nothing to prevent their setting up some kind of a scientific project in which they are interested just the same as the farm boys are interested in the farm problems of their communities.

Mr. STEVENS. That is correct.

Mr. BAILEY. I think there are a lot of possibilities and I just wanted to get your reaction.

Mr. STEVENS. My reaction is quite favorable to this. We feel also that we can work with these organizations as we have been doing with the Future Engineers in terms of going into the high schools and junior high schools with our program.

We stimulate in the minds of the students a desire to go into science. At the same time, we help the science teacher by supplying him with the literature and some directions, and so forth, to get a club started in that school.

We help him out and we are only maybe in that school 2 hours. In that time we have already stimulated interest in the students who are interested in joining a science club and we have singled out the science teacher or teachers and given them aid and help where it is needed in order to get a club started.

Then we send them the monthly publication, the Future Engineer, which you have a copy of up there, I believe.

Mr. BAILEY. Yes, I do.

Mr. STEVENS. This is only the second issue that you see there of the Future Engineer, which is a major undertaking on our part of an organization which has a very small budget. A lot of that work is done free by the printing companies, and so forth, in order to get the magazine out.

Mr. BAILEY. It is a very attractive program.

Mr. OVER. Might I make the suggestion, Mr. Chairman, that we have an article on page 36 that Mr. Stevens wrote up in answer to so many requests from schools all over the country for the construction of the Tesla coil or the Oudin resinator.

He put in a complete set of plans for the construction and understanding of it, which is not a simple unit, actually, to construct.

We have a little one sitting in front of you there on the front of the table which we would like to show you a little later, if you do not mind.

At any rate, so much for that. I would like to suggest that in your interest in this particular area you might, if you have not already, contact Mr. Joseph Kraus, who is coordinator of National Science Fairs at 1719 N Street in Washington, and Mr. Kraus at the present time is, through Science Service, doing science fairs to a limited extent over the country.

In reference to this other thing, you might be able to get some help from those people or some suggestions as to how this might be best handled, because they seem to be very efficient people.

We would and have agreed to work closely with them in this same respect as well as with the Science Clubs of America, which is also located at that same address.

Mr. BAILEY. It might be worth while while you are in Washington to consult Congressman James Wright of Fort Worth, Tex. He is the author of the proposal to set up a national organization known as the Future Scientists of America.

Mr. STEVENS. An organization does exist now by that name.

Mr. BAILEY. However, they want to give the national recognition and issue a charter like they issued to the Future Farmers.

Mr. OVER. I think this, in a sense, is probably one of the most constructive suggestions made. We know the effectiveness of the groups like the Boy Scouts of America.

Mr. BAILEY. I have not gone into the proposal. I just glanced at it when it was referred to my subcommittee and I see the possibilities in it. I want to conduct hearings on it and, if possible, put the legislation through the Congress.

Mr. OVER. I might make a suggestion. My own background is in psychology. I have a master's degree in this field. One of the areas I would suggest where this is a most valuable contribution is in this respect:

Many of the people who are responsible for the so-called juvenile delinquency are individuals of superior intelligence who have never been challenged sufficiently by any school or field.

Mr. BAILEY. They have misguided and misdirected energy?

Mr. OVER. Yes. Most of the people find that the trouble in school does not come from the quiet subdued child, but from the child who is filled with energy and ideas who constantly irritates and bothers them, and these are the people who really need the stimulation of interest, because these are the people who have the talent to continue in this area in many respects.

Mr. BAILEY. A question to you, Mr. Over. Your organization, being a private organization, does not in any way attempt to supplant the program of science within the high school itself? You are more in the nature of creating added energy and showing the possibilities?

Mr. OVER. Yes, sir. I think we might take exception in one area there. Our attempt is not to supplant it, but in many cases we do supplement it in this respect; that we present units or devices which either the school cannot afford to entertain or own, or it might be a little too dangerous for them to handle themselves, or might not just be available to them because it is so new and different.

We deal with some very new devices that are available to us because we get them practically in the experimental stage in some instances.

Mr. BAILEY. Are you doing far enough to give them a glimpse in the future of the possibility?

Mr. OVER. Yes, sir. It is the future that is now the present, actually. For instance, we deal not with science fiction in our school programs, but these things which are sometimes so different as to almost seem like science fiction and yet they exist today.

This thing is not new. This oudin resinator is not new. Yet you would be astounded at how many people have never heard of this and have never seen it in operation.

Two of our programs deal with the field of ultrasonics, which is a very new field of science. It is just coming into its own with tremendous future for someone who wishes to specialize in it. It is very, very rapid sound, very high sound.

Well, the human ear hears about 20,000 vibrations per second, and ultrasonics run well up into 1½ and 2 million vibrations per second.

This field has some fascinating ramifications and it is still in the experimental stage. Ultrasonic units are being used by industry in a number of places for cleaning tiny parts. What used to require

one skilled technician to clean in 20 minutes a single part, now will be cleaned in 5 minutes by ultrasonic units, with a liquid simply blasting all the dirt and small particles. They now have ultrasonic drills which can drill teeth painlessly and the fillings last longer because the hole is just as smooth as though it was highly polished.

Ultrasonic disposal units are being developed in Kansas City by which you throw your garbage in and it chews it up silently. There are also ultrasonic dishwashers and ultrasonic washing machines. The practicabilities are practically unlimited in this field.

This is a whole new field of science that is now available to some of these people, if they want to come out of school and follow it, and this is just one of many that we know.

Mr. STEVENS. We deliberately try to avoid using any demonstration that they may already have in their school. In other words, if you normally find something in a high school chemistry laboratory and/or a high school physics laboratory, then we do not have it in our program.

We try to give them something that they would not be able to see ordinarily.

Mr. OVER. Could I continue on this area of suggestion?

Mr. BAILEY. You may.

Mr. OVER. I do not want to take any more of your time than we have to.

Mr. BAILEY. That is all right. We have about 20 minutes yet.

Mr. OVER. We would like to establish a means with this same program for schools to communicate with each other. We found that there is a tremendous lack of communication between schools.

Two schools 20 miles apart will be unaware of what the other school is doing in the field of science. They might know how the baseball teams and football teams stand, but they do not have the vaguest idea of what is happening in science. So we hope that by the publication of this type of paper we would be able to list what various schools are doing and what projects are undertaken, and whom to write to if someone else's school is doing a similar thing.

They might want to join forces or to share ideas. We also suggest that there is a strong value in the idea of exchanging student science exhibitors between schools.

If a school can afford to send a whole basketball team or football team to another town 20 to 50 to 100 miles away, why could they not afford to send their 1 or 2 science people, who may have developed a very interesting demonstration, to demonstrate to another school?

Mr. BAILEY. I can see the possibility of a program of that kind.

Mr. OVER. This also would indicate that some schools who would have no science programs at all might be stimulated by what another school is doing. Maybe we could start sort of a friendly competition between schools in this area to see who could undertake the most fascinating projects and that sort of thing.

We would like to do this. This is what we have in mind.

Mr. BAILEY. If you could generate half the energy that you have presently in the success of the basketball team or football team, we would solve this question of science very quickly.

Mr. OVER. Yes, sir. Of course, we mention the idea of making available kits and projects at minimal cost to students or to schools

for use in this area. In other words, if we sent out 100 theremin kits throughout the United States, this is not flooding the country with theremin kits, because this thing is just as new to someone in Minnesota in a school as it will be to someone in Maine in a school, or in some other State, and not many of them are going around to make a thing a usual thing.

We mention, again, this paper encouraging active interest in clubs. We would also like, and we have already contacted, a number of the publications that are available commercially—Popular Science, Popular Electronics, and others—with the idea that if we have an organized club set up throughout the United States, we can get special discount publication rates for these people and for the clubs, and they have already said "Yes." This is wonderful. They will give us this advantage.

We would like to offer an answering service, which we are doing already—Lord knows, about 400 questions a week—to answer questions submitted by students and schools and publish them instead in the paper and perhaps set up some sort of an award to the 10 best questions of the month, or something like that.

We would like to keep a listing of demonstrations and exhibits that are available to schools all over the country, and there are thousands of them, if the schools were only aware of them, in the field of audiovisual education and science.

Industry offers a number of things. The Government offers a number of things. Private foundations offer a number of things, and most people simply are unaware that these things exist, and I am particularly familiar with this area because my field of teaching at San Jose State was audiovisual education and I think most people would be flabbergasted if they knew how much free material was available from various places and if they just knew where to write and ask for it.

The AEC at Oak Ridge will send out a unit that takes up practically 4 or 5 rooms full of audiovisual material free of charge to a school, if they will demonstrate it.

Most schools are simply unaware of this. We would like to publish, in advance, notices about programs or demonstrations that are being conducted in various areas in the country.

As an example, we know of a number of closed circuit television companies who make demonstrations for, oh, industry or someone else in a particular area, and they will have an open house, so to speak, demonstrating this new equipment. We can find these things out because we know about a lot of them and we could tell the schools where these demonstrations are being put on in advance so they could utilize the facilities free, and industry would gladly invite them if they had the time because they are most interested in selling equipment.

They would welcome the schools if they wanted to bring the children in to see them, such as the Western Electronics Convention, which is held once a year, which is a fantastic program and would be well

As an example, we know of a number of closed-circuit television just to see these demonstrations.

If any of the material that we present to the schools is science fiction, in a sense that it is new, Lord, the material that is presented at the Western Electronics Convention is almost fantastic.

I remember 5 years ago seeing a television phone that you pick up and you talk to, let's say, the St. Francis Hotel in San Francisco from the fair and somebody at the other end picks it up and you are sitting there talking and looking at the person that you are talking to, and that at the time was very commonplace for them, though most people of the country think this is projected science fiction. Bell Telephone is already making arrangements for the thing.

We would like to list these things. We would like to go back into this area of the academic field of interest in science and list what advantages they offer and what they are paying, and the demand, and so forth, to the best of our knowledge at the present time at least, and a projection into future perhaps, and we would like to list the colleges and universities.

We would like to start some sort of scholarship thing where each month a scientist of the month would be chosen in 1 of the schools who had completed a very fine project or 2 or 3, and perhaps the science teacher of the month who has contributed most in his particular field, and make some sort of an award.

We would like to make a listing of scholarships that are available again.

The next sheet shows our immediate staffing, Mr. Stevens, and his brother and myself, and our backgrounds and our own degress, and so forth, and the rest of the staff all the way through. And we are very fortunate in that we have a staff that has a background that is better than some schools, actually.

We have as many degrees as some schools and certainly our people are diversified because in our business we have to be everything. We have to understand several fields or else we would not be who we are; in other words, able to take on these science fictions. One does not realize, until he tries to get into this business, that this is a fantastic enterprise.

We undertake many things. We have a unit being constructed right now in Ocean Park, Calif., that consists of a rocket trip to Mars, a trip to the planet Mars and then back to earth by matter transmission. This is not a motion picture. This is an actual physical trip.

Of course, obviously, we are not going to Mars yet, but the people who take the ride will be convinced that they are going, because they will experience takeoff gravity pressure, and they will experience free fall, and they will go through the three different stages of takeoff.

They will then land on Mars, be conducted through the planet, and all the effects are extrapolations of known facts. We are sticking as close to facts as we can, those things that we do know about rocketry, and gravity, and so forth, what we think we know about Mars from observations, and of course the matter transmitter is a hypothetical thing, but it is not inconceivably possible.

The sound is rather strange, but it has been hypothesized that in some future time it will be possible to take matter, transform it into energy, transmit it, and then reassemble it at some other point back into its original form.

This, of course, will mean very rapid transit from one place to another, and we suggest to our travelers to Mars that they are coming back from Mars by matter of transmission.

Mr. STEVENS. This particular ride to Mars is something that is being built up as a concession in a Disneyland type of amusement park, but it is working on an educational basis.

Not only do the people enjoy the experience of a sensation, but they will actually get a general picture of what might be on Mars when they get there. It takes up an area of some 12,000 square feet and it will cost in the neighborhood of $250,000 to produce.

This is one thing we are engaged in, and it requires a tremendous amount of scientific background to produce this type of thing. We have drawn on a lot of experience of a lot of people.

Mr. OVER. We have a blueprint of what this thing is going to look like down there, if you would like to look at it later on. We would be happy to show it to you.

The next sheet we have listed in here, with your permission, is a list of our program operating eypenses per week as the programs now exist.

In spite of the fact that we lose money on the programs, we maintain, and we are ready to stand firm and establish it, that we operate at a much more economical rate than any similar programs now in existence.

The operation of a science program is perhaps the most expensive type of assembly program that can go out, primarily because of the initial cost of the equipment and, very, very important, the fact that we must pay the people who do these programs an excellent salary because we have to have excellent people.

We search very diligently through numerous people by listings in colleges throughout the country in order to get just the right people.

They must be a combination of some very difficult things to begin. They must be, first of all, a good showman with the ability to educate audiovisually with dynamic ability.

They must have a good technical background so they can answer any questions. Of course, they have to be free to travel constantly because that is what they have to do, and they have to be extremely dependable people with a very good reliable background so that we can make sure of our program.

They have to be able not only to maintain their equipment, but understand it, and the effects that they are producing, and related science areas so well that they can answer any questions that might occur.

We have 1 man with each program traveling and doing 3 shows a day throughout the country. We hardly can realize how anyone else could do these programs any more economically than we are now doing them, but we list this list of costs.

Then the next sheet shows a summary of costs for 7½ programs, but we would like to extend that in your thinking to 8 because 7½ meant that we would have 7 full school-year programs and then one-half year program. But since this has been printed up it has been extended to a full year. And as to all of the other programs, we estimate we are doing about 400 shows for each 1 and now they have been extended to about 450 shows or better, and we usually find before the end of the school year they have been adding shows on us because other schools come into the thing before the year ends, so we list that material.

We list the cost of production and we show that. Let's say, in these 8 programs next year we are going to lose about $39,250, but if we extend this to the number of programs that we are doing and the number of students who will be seeing these, this again is a change-over here now because instead of showing 2½ million students we must now show almost 3 million, and that is going to cost actually a cent and a third subsidization per child per school in order to continue the programs; about $11 a program in order to do it.

We suggest it be done on this basis so the Government is satisfied, or whatever agency, that no one is taking advantage of them. We book all of our programs through a standard agency. This agency keeps a very accurate record of all the programs that are done because they have to charge the school for each program.

Each school, of course, where a program is presented, could verify that a program was there. We have to keep an accurate record of all the programs we present so that there will not be any chance of collecting for programs that are not actually done.

This could be handled in any way they might see fit. I would like to move to the next sheet.

Mr. BAILEY. Before you leave that particular angle of your presentation, in your conferences with the Department of Health, Education, and Welfare, did they express any thought that they might be able to include assistance to a program of this kind through congressional appropriations?

Mr. OVER. Sir, I found 2 avenues that were suggested; 1, if we had the sponsorship of a nonprofit organization, we would then perhaps, according to what I was able to find, be eligible for partial sponsorship in this case by the National Science Foundation, who have been authorized by the Department of Education with funds to do this.

That does not mean us, necessarily. That means whoever can do the best job. We would like to think that we do. We know so far that no one has offered us any competition in this field because hardly anyone wants to operate at a loss on programs as we have been doing.

Now, another suggestion that was made was legislation which would make it legitimate for the Government, through some agency, to partially support a program like this.

Apparently there is no precedent for partial support of a private agency without some sort of sponsorship. We thought that we would take both approaches because one might not work for us. But we do know there is a precedent for a private agency operating Government facilities.

I think the Atomic Energy Museum at Oak Ridge is operated by money from AEC and the National Science Foundation, completely privately; that is, it is a private company, so to speak, operating the program.

This also includes the shows, the road programs that they have, which they, incidentally, have found so successful they are going to double them next year they hope. That will mean 400 or 500 schools during the school year. That will mean 16 programs of theirs reaching about 400 or 500 schools.

Our 8 programs will be reaching 4,000 schools. So again we are not worried about competition in the field. They are not competing

with us and we are not competing with them, nor do we feel that they are not worthwhile.

There are certainly not enough people doing this short of thing. We welcome competition. We would be happy to tell anyone that might be interested in taking up this endeavor exactly how we have done it and how they might do it exactly as we have.

Mr. BAILEY. You had better proceed with your presentation.

Mr. OVER. The next section simply shows some of the brochures that go out from the various agencies and from ourselves. Then the balance of the material shows the actual demonstrations themselves as they now exist and actually what is in the demonstration.

I will not take your time to read through this because it is quite extensive. But, if you have a few moments, I would like you to see what the actual demonstrations are.

There is no static; it is dynamic. It does not remain this way from year to year. Each year each one of the programs is changed or altered in some way which we feel is an improvement because we come across new devices in a particular field.

One of our programs deals largely with sound, chemistry, light, and electricity. When we find something that particularly improves this program, we add to it and maybe we subtract something else from it that is not as exciting or new anymore.

Another program deals with sound practically entirely, and this program is very expensive in this area; one of ultrasonic and stereophonic sound, and polarization and that sort of thing. We change this program accordingly.

We have a third program which deals with gyroscopic effects, effect of color on the human eye, and radio frequencies, and we alter this program to its best advantage.

And then our chemistry program is our final type of program, and this, of course, is constantly being changed. We are always trying to add something new to it that will be effective and different from anything else that is being presented or shown today, and, in many cases, many of these effects are such that they can be duplicated by the school if they wish to, but they have not been up to this point because they were not aware of them or they did not have the know-how, how to do it.

We would like to have you look at that, if you have a moment. Then we have this article on the Tesla coil, which is in the back. We would appreciate it if you have a moment to look at that. I think you would find it interesting.

We have other printed materials, which, of course, we send out that I do not happen to have with me, on the construction of other things, magnetic field generators and things like that which we also make available to students in school at no charge. If you have a moment, when we finish we would like to show you this little thing we have up in front.

Mr. BAILEY. Have you concluded your formal presentation?

Mr. OVER. I think so, sir.

Mr. BAILEY. I would like to ask the other gentlemen if I open hearing in the subcommittee on this proposal to take national recognition of an organization similar to your future engineers, which could very well be future scientists and engineers, would you be available for an appearance before the subcommittee in a hearing?

Mr. STEVENS. I think so, yes. It would depend somewhat, but as of now I do not see why not. When would it be?

Mr. BAILEY. I do not know right now. It is pretty difficult to run two subcommittees on education at the same time.

We have just concluded some legislation in the field of Federal impact on school districts and that is practically out of the way now. And this program is now underway of making scholarship grants and grants to the States for selection of outstanding students and things of that kind. But I do want to open the hearings before too long and possibly by the middle of April.

Mr. STEVENS. I would say "yes" in answer to your question.

Mr. OVER. I would like to read a few letters we have received that might be of interest to you, if I may.

Mr. BAILEY. All right.

(The letters are as follows:)

HAWTHORNE HIGH SCHOOL,
Hawthorne, Calif., March 9, 1956.

To Whom It May Concern:

It was a real opportunity for our students to see the outstanding science show, Through the Science Barrier, presented by Mr. and Mrs. Carlile Stevens on February 29, 1956, in three assembly programs at Hawthorne High School.

The program was very popular with the students because it was exciting and aroused their curiosity. It held their close attention and stimulated a great deal of interest in science as well as thoughtful respect for other discovered and undiscovered wonders of this scientific age. For these reasons we believe the program offers much that is uniquely valuable to young Americans everywhere.

Those who present Through the Science Barrier are, in my judgment, making a real contribution to the education of young people as they inspire them to think, to create, and to direct their lives wisely in the atomic age. In this unique way those who present the program are themselves serving our country.

Mr. Stevens and his wife presented the show in a delightful manner. His own keen intellect and scientific mind were evident to all who heard and watched him. He recognized and used his ability and opportunity to teach, inspire, and influence his young audiences.

Aware of his own responsibility as a scientist today, Mr. Stevens is exceptionally well qualified to quicken the sense of responsibility and opportunity in young people today as they face into the future with all of the problems of humanity to be solved.

It is a privilege to recommend this outstanding show, Through the Science Barrier, for audiences of any age. It is particularly suitable for junior high school and senior high school youth.

Very sincerely yours,

E. ALICE BEARD,
Director, Curriculum and Guidance.

Approved.

W. S. NYMAN, *Principal.*

MADISON JUNIOR HIGH SCHOOL,
Rexburg, Idaho, December 6, 1957.

ROBERT COOK,
Care of Up 'N Atom Electronics,
503 East Hyde Park Place, Inglewood, Calif.

DEAR SIR: On November 13, 1957, Bob Cook presented us a favor by giving us an unscheduled performance on his Up 'N Atom program. I would like to take the opportunity to rate your program quite highly for students between grades 7 and 10. We have found the reaction to the program very commendable, and created a great deal of interest in these scientific times.

May we, as a student body, extend to you our appreciation.

Sincerely,

JOHN L. HASLEY, *Principal.*

ONAWA, IOWA, *October 21st.*

UP 'N ATOM, ENTERPRISES,
Inglewood, Calif.

GENTLEMEN: Your representative, Roger Over, put on a show in our town today and I thought it was great. While I am primarily a photographer (formerly a science teacher) but am also a parent * * * of a junior boy who is highly interested in "stuff" as Over presented today.

I had a very enjoyable talk with him, mainly after the program. I was selfishly active in our visit. Since my son had to dash for the locker room for football practice I had instructions from him to "get all I can from the man that you think I can use." While a junior in school he has puttered for past several years in electricity and this year has settled down more on several projects to work out for this year as well as ideas for next year. With several Tesla coils around his half of the basement, he isn't satisfied with 1½-inch spark gaps and has been looking for ideas to build a much greater size.

Mr. Over gave me your card (marked Robin Stevens) and said to contact you and tell that he, Over, suggested to send us what you wished on the Tesla coil. Of course, he wouldn't try the million-volt job you have but he wants a much larger one than the mechanical unit he has now.

Bruce, my son, took his Electronic Experiment Handbook 1957 with him and found out from Mr. Over that your hookup was quite similar to the Theremin you have. Bruce has been trying to run down all material he could get past year to work out one of these units. Again your man said to ask for any drawings or material you might care to give regarding such a construction. I understand you have made some changes due to a change in power outlets for the unit.

I have been doing what I can to assist him in high great desire along this line. My studio life keeps me down here working most of the evenings but I try and get what equipment and parts where I can for him. He wants to work out a number of worthwhile experiments and demonstrations and several of the small schools in the county to demonstrate next year. Superintendents around here think his idea of showing and demonstration what a high school student can do will mean a lot more in encouraging other students to become more active in experimentation work themselves. It should help create more interest for such programs that your organization give, I think.

Again, any information that you care to send, ideas yes, and even words of encouragement will be greatly appreciated and mean a lot to him. The next time we visit California we'll accept his invention to drop in on you * * * we were there last summer in Glendale for several weeks * * * if we had only known then.

Why not address your reply to the boy, Bruce Hudleson, Onawa and, of course, I'll be seeing it to.

Again thanking you for a greatly appreciated favor, I remain,

Very sincerely yours,

M. D. HUDLESON.

STAR VALLEY HIGH SCHOOL,
Afton, Wyo., October 30, 1957.

GENTLEMEN: We enjoyed the program furnished by Robert Cooke today here at our school. The entire student body was attentive and responsive. That type of program is popular and educational for young people.

Yours very truly,

B. DELOS GARDNER, *Principal.*

PHILLIPSBURG, KANS., *December 18, 1957.*

DEAR MR. OVER: The Phillipsburgh Junior High would like to thank you for the wonderful science lyceum Monday, December 16, 1957. It was very interesting and I am sure we all learned so much from it.

Thanks again.

Sincerely yours,

DORIS MARIE CAVIN, *Eight grade class, Secretary.*

JEFFERSON, IOWA.

DEAR SIRS: After the program today at the Jefferson school I talked with Robin C. Stevens. He said, if I wanted any plans to any of the electronic equipment, to send to you. I would appreciate it if you would send all the plans, books, and information on ultrasonic sound, so I may do some experiments I have been wanting to do. I am very much interested in the field of electronics and hope to make the grade of an electrical engineer in the near future.

Yours truly,

ROBERT THOMPSON.

INGLEWOOD, CALIF., *January 13, 1958.*

DEAR SIR: Will you please send me the plans of the electrical instrument demonstrated by one of your agents in one of your lyceum plays. Was shown here in our school. Agent told me I could get one free by writing to you. I enjoyed this special lyceum play very much as I like science. I'm in the eighth grade. Thank you very much.

Sincerely yours,

KENNETH E. MARK.

HOLLYWOOD CHAMBER OF COMMERCE,
Hollywood, Calif., December 3, 1954.

Mr. CARLILE STEVENS,
Up 'N Atom,
919 Inglewood Avenue,
Inglewood, Calif.

DEAR MR. STEVENS: I recently had the opportunity of seeing your show, Up 'N Atom, as presented in the city of Sierra Madre. In my opinion, you have one of the finest educational and entertaining programs that I have seen. The equipment and the scientific effects gained through its use certainly held the attention of the audience and at the same time provided to those in attendance knowledge of the field of electronics.

Yours sincerely,

LORNE B. PRATT,
Executive Secretary.

GLENDALE UNIFIED SCHOOL DISTRICT
WOODROW WILSON JUNIOR HIGH SCHOOL,
Glendale, Calif., April 16, 1956.

To Whom It May Concern:

Recently I had the pleasure of seeing the program called Up 'N Atom.

The program directors, Mr. and Mrs. Rice, gave an excellent account of themselves and their show in the 45 minutes which followed.

It takes a superior brand of entertainment to interest and hold the attention of high school audiences today. I feel that this particular production does just that. In addition—such a program performs a service to the public in stimulating youthful interest in scientific research, which is so necessary to keep America strong in every way—in order to continue to guide wisely the affairs of the world.

I'm certain that I can speak for the nearly 1,200 students and the faculty of Wilson Junionr High, Glendale, who saw this fine program on March 21, 1956.

We thoroughly enjoyed the presentation from start to finish, and it is a privilege to recommend Up 'N Atom to other schools and audiences in general.

Sincerely,

DIVIE B. DUFFIELD,
English Instructor.

P. S.—I have been a teacher in Glendale's schools for nearly 11 years, during which time many, many programs have come under my observation. Up 'N Atom rates with the best.

D. B. DUFFIELD.

Mr. BAILEY. We appreciate your appearance and if you have any additional information to offer for inclusion in the record, do it at this time.

Mr. OVER. I think we can only hope that the committee feels as strongly about this as we do. We would very much like to continue with this type of program.

Mr. BAILEY. I regret very much that there were not other members of the subcommittee present for your full presentation and your demonstration.

As I said at the beginning of the subcommittee meeting, I am filling in for Congressman Elliott who is absent from the city today. He has instructed me to continue these subcommittee hearings, and the committee will reassemble on next Wednesday, February 26, when the witnesses will be Dr. Robert Goheen, president of Princeton University, and Dr. Henry Chauncey, president of the Educational Testing Service, Princeton, N. J.

The subcommittee will stand in recess until Wednesday, February 26.

(Whereupon, at 11:45 a. m., the hearing was recessed until 10 a. m., Wednesday, February 26, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

WEDNESDAY, FEBRUARY 26, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION AND
SUBCOMMITTEE ON GENERAL EDUCATION,
COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10 a. m., in room 429, Old House Office Building, Hon. Carl Elliott presiding.

Present: (Subcommittee on Special Education) Representatives Elliott (chairman), Green, and Nicholson; (Subcommittee on General Education) Representatives Metcalf, Udall, Frelinghuysen, and Haskell.

Also present: Representative Thompson.

Staff members present: Charles M. Ryan, general counsel; Kennedy W. Ward, assistant general counsel; Fred G. Hussey, chief clerk; Mary P. Allen, clerk (Subcommittee on Special Education); Robert McCord, clerk (Subcommittee on General Education); and Russell C. Derrickson, chief investigator.

Mr. ELLIOTT. The Subcommittee on Special Education and the Subcommittee on General Education, meeting together, will be in order.

We are very happy to have as our first witness Dr. Robert Francis Goheen, the president of Princeton University.

Dr. Goheen has earned for himself a great reputation in the field of education and, as the chairman of this subcommittee, Doctor, I am happy to welcome you and say to you that I am sure that every member of this committee is looking forward to what you have to say.

I might say also that your reputation with this committee has grown a great deal from the fact that we have two gentlemen on this committee who are familiar with Princeton and a gentleman from New Jersey, Mr. Thompson, who represents the area.

Have I not heard you mention Princeton?

Mr. FRELINGHUYSEN. I am an alumnus of Princeton, Mr. Chairman.

Mr. ELLIOTT. You are among friends and we are anxious to hear what you say, Doctor.

STATEMENT OF ROBERT FRANCIS GOHEEN, PRESIDENT, PRINCETON UNIVERSITY

Mr. GOHEEN. Thank you very much, Mr. Elliott, Mrs. Green, and gentlemen. I was truly pleased to receive Congressman Elliott's invitation to appear before his subcommittee to discuss the matter of aid to education beyond the high school, and I welcome the chance to be here today.

Our institutions of higher education, whether they be public or private, face some very major challenges and problems. Whether we shall be able to surmount these challenges and problems, and how we go about doing so, seem to me to be matters of very great consequence for the welfare and progress of our Nation as a democratic society.

With your permission, I would like to direct my initial remarks to principles rather than to programs, and to start with two general propositions which I feel must be taken into account in any programming which is attempted for American higher education.

The first proposition is this: that almost anything that we may seek to do for American education must be considered as relating to and having implications for the total nature of our society, including the ability of this society to continue to cultivate the individual person and the other democratic and humane values which we prize. Thus it seems to me obvious that improved chances for study and research must be opened today to those minds which are capable of scientific excellence. This is a matter both of survival and of progress at our time in world history and it is rightly a matter that deserves priority of attention in these times.

At the very same time, however, excessive preoccupation with science and technology in our schools, colleges, and universities could very well be our undoing.

Now, the best short statement of this need for variety, for balance, for wholeness of viewpoint in education of which I know is that of Herman B. Wells Educational Policy Commission in the report which that commission issued on January 3 of this year. I would like to quote a short excerpt from that report:

> **Survival in this age may be staked on science but the building of peace calls for knowledge in societies, and abilities of many kinds. Thus the philosopher, the historian, the social scientist, the student of language and literature share with the scientist the promise of the future. The success of democracy rests on wise citizen participation in public affairs and on respect for the individual wherever his talents lie.**
>
> **The real need is for those qualities of mind and spirit which will enable the American people to survive in times of tension and to achieve their own ideals.**

My second guiding proposition is that there are today real and disturbing deficiencies widespread in American higher education beyond those in the teaching of science and mathematics. Unquestionably the worst of these deficiencies is the shortage of teachers of true ability and trained competence, a shortage which applies in virtually every field of study and on every level of education from the elementary grades through the graduate schools.

Another basic deficiency is the inadequacy of academic plant for swelling school and college age population.

A third, which is more peculiar to universities, is the strain and the pull upon their human and monetary resources that is already being felt by many institutions because of the very large and very expensive types of equipment which are required for advanced instruction and research in most areas of modern science and engineering.

Now, I could expand on these three types of problems and probably add others. My purpose now is simply to suggest that these things on which I have touched, that is basic inadequacies in faculties and in facilities, these things contain the seeds of a very serious and widespread deterioration in the capabilities of our colleges and universities, unless these institutions can achieve a significant eco-

nomic breakthrough and do so on a broad front, including the humanities and the social sciences no less than the basic sciences and engineering.

You will notice I think that I have not listed as one of our major deficiencies, primary deficiencies, our inability to draw out of the high school ranks all the young people of high talent who graduate from high schools. This seems to me to be a real problem, but not as acute as the problems which I have touched upon. Indeed, it seems to me that if we increase the supply of young people of ability going into colleges and do not improve our abilities to handle and educate these people of high ability when they get into colleges, we will have done them no service at all, and I would like to emphasize this point by quoting from the recommendations of the committee on the development of engineering faculties, a committee of the American Society for Engineering Education. Their report includes this paragraph:

> The most critical shortage affecting engineering education at the university level is and will be for the next decade the shortage of engineering teachers. Of secondary but critical importance is the deficiency in laboratory, classroom, and office space. These resources are insufficient for present enrollments and for those that we expect. Therefore, unless and until these critical shortages are relieved, programs which aim primarily at increasing the supply of undergraduate engineering students beyond those now in society are highly questionable. On the other hand, programs to support improvement of their high school preparation in English, mathematics, science, languages and history are most important.

Now, this statement with respect to engineering could be applied to virtually any field of academic concern at the college or university level that one wished to name.

My own basic concern then as I view American higher education today are twofold:

First, I am concerned lest, because of the Russian military and technological threat, American higher education becomes stampeded, impelled or allowed to drift into serving our pressing scientific and technological needs at the expense of serving our no less vital but more long-range needs for social, political, and spiritual knowledge and understanding. Granting both the military and economic promise inherent in scientific technology, as I look ahead I cannot see a future for this country in which personal, social, political or moral or spiritual problems are going to become any more simple or any less demanding of intelligent understanding, not if this society intends to remain democratic.

Then as I look outward from America, it seems to me very likely that the contest to win the allegiance of the millions of peoples in the uncommitted nations of this world will turn in the end more upon our moral and cultural posture, on our ability to make live and to transmit our democratic humane ideals than upon our military and technological posture.

Further, it seems to me axiomatic that the more power which men can control, the more automatic and devastating the instruments of destruction which they control, the more do men need wisdom, moral and spiritual, social and political.

Secondly, this possibility toward imbalance, toward education for defense and immediate needs increases, you see, my concern about the existing inadequacies which we have in our faculties and facilities,

and this possibility of imbalance heightens the danger of a serious deterioration in the quality of our educational offerings in the years ahead. These inherent weaknesses to which I have pointed have been occasioned to a large extent by inadequate finance. Yet enthusiasm and support, if they now concentrate on two areas alone as, for instance, science and mathematics and possibly language teaching, this kind of support will not relieve the general situation. Indeed, it is very likely to aggrevate the weaknesses in other critical areas.

It seems to me sheer folly to hope or think that Federal planning and Federal aid can do the whole job that needs to be done in American higher education. Instead, I most seriously believe that each type of institution, private, public, large, small, each type of institution will have greatly to intensify its calls upon every possible source of resources that are available to it and, if we are to do the job which must be done, this will certainly have to include large State appropriations for State universities, particularly, I would say, in my own State, and substantially increased tuition charges for private institutions, unpleasant as both those prospects are.

I am convinced, however, that substantial Federal aid is also necessary. After all, the health and vigor and balance of our educational system, both in its public and in its private sectors, is a matter of national importance and it seems unlikely to me that even our strongest State and private universities can meet on their own the requirements of our times and of the times ahead. It is not unnatural, I feel, that Federal assistance should be aimed first to secure improvement in areas of the most immediate national concern. Yet programs for Federal aid, even when aimed particularly at immediate needs in science and technology, should be so designed as not to encourage within our schools, colleges, and universities imbalance toward scientism and a deteriorated effort in other areas.

The President's program, I believe incorporated now in H. R. 10278, seems to me to do just that, particularly in seeking to provide preferential salary rates for teachers of science and mathematics, a step whose effect upon the teaching of English, history, and Government in our schools I shudder to consider. It does this also in failing to recognize that each student who attends a college costs that college cold hard dollars and reduces its ability to maintain an adequate faculty and high levels of instructional standards in these days of high costs and economic strain.

Before pointing to what seems to me to be a more soundly conceived program, let me try to suggest one more general recommendation, namely, that in my view Federal aid to education, scientific or otherwise, should be designed so far as possible to permit and to encourage our schools, colleges and universities to free more of their existing resources for application to improved faculty salaries.

No key to our problem is more important than this; that is, a significant improvement in the economic status of the teaching profession.

The program of Federal action to strengthen higher education advanced by the American Council on Education has among its merits attention to this last point in each of its four major parts. I presume that the members of these subcommittees have seen and studied this proposal issued by the American Council on Education.

May I remind you briefly that it includes grants to graduate schools offering the doctor of philosophy degree to speed up the output of college teachers through fellowships which will relieve students in training for college teaching from various miscellaneous chores which they now often have to undertake to make their way, and let them concentrate on getting their training, getting their degree and getting out into teaching. This recommendation includes a cost-of-education payment to the institution which is training the graduate student with a fellowship.

Second, the American Council proposal recommends financial assistance for the expansion of facilities, scientific and otherwise, either by matching grants comparable, say, to those now available for research activities in medicine and the health sciences, or by low-interest-rate loans over long periods.

Third, it proposes financial aid to qualified students and their families by two main methods. One is by tax credit of 30 percent to a family on the amount which it pays for tuition and fees in education. The other is a recommendation of a broad Federal scholarship program which recognizes that scholarship students who come to universities and colleges cost the universities and colleges money, and includes a $500 cost-of-education payment to the institution.

It also recommends, and I think this is very important, the modification of existing Federal programs so as to remove a drain upon the institution for services which it renders for the Federal Government. It proposes that all programs, whether they be the military research officers training programs or highly advanced scientific research programs under Government contract, be handled on a no-gain, no-loss basis for the institution, and this seems to me very important in view of the many economic pressures under which our institutions are working.

The American Council has also endorsed the recommended substantial increase in the budget for the National Science Foundation, with which I would heartily concur, and it has endorsed the President's proposal which would aid to strengthen modern language teaching in our schools.

Now, as I say, this kind of a program makes good sense to me. It makes good sense to me not only because of the aid which it offers, but because of the fact that it recognizes broad economic problems which our institutions face, and it counteracts, or at least it counterbalances in some measure, the danger of exclusive concentration upon science and technology.

Mr. Elliott, this is a bit longer statement than I meant to make, but I have nothing formal further to say. I would rather take on questions.

Mr. ELLIOTT. Thank you, Mr. Goheen.

First I will recognize your our Congressman, a member of this committee, the gentleman from New Jersey, Mr. Thompson.

Mr. THOMPSON. Thank you, Mr. Chairman.

Thank you very much, Dr. Goheen, for taking the time to prepare a statement and to come here. We realize how very busy you are. I am especially grateful to hear the president of a great university emphasize the need for a well-rounded education. I think that it

would be tragic to emphasize too heavily mathematics and engineering and the basic sciences to the exclusion of the humanities.

I would take it from your testimony, Doctor, that you would favor a rather large and liberal Federal scholarship or loan program. Is that so?

Mr. GOHEEN. I think I would particularly favor a loan program. I would favor a scholarship program in principle, and with the one qualification which I tried to make.

It seems to me, of course, as I said, very important that we get up into colleges and universities as many of the really high talented young people as we can get, and we know that we are losing a lot of them, that they drift off for one reason or another after high school. At the same time, it will do us no good to increase the numbers of these young people coming into our colleges and universities if the colleges and universities cannot hold up and increase their ability to perform good service, good education of these young people.

Mr. THOMPSON. In other words, you feel that, in addition to the national interest in the students themselves, the national interest also runs to institutions, public or private, upon whom it devolves to educate the young people.

Mr. GOHEEN. Surely, to the quality of the education which they will receive.

Mr. UDALL. Will the gentleman yield?

Mr. THOMPSON. I will yield.

Mr. UDALL. I have just a couple of questions. I must go to another meeting, which I regret and for which I apologize.

I have had the feeling, which I think most of us have had, that, of course, this is a many-faceted problem and we need a sense of balance. I think the statement presented by the witness this morning has been one of the best we have had from the standpoint of balance. I have been very impressed with it and want to commend Dr. Goheen on it.

On this matter of quality of education, we are told that the race with the Soviets and countries allied with it, the race for intellectual achievement, may over the long haul be more important, for instance, than the present missiles race. If that is true would you feel that, to produce excellence, that assistance, say at the graduate level, because there are proposals of that kind in some of the bills before us, probably might be as important or more important than some of the other proposals that are talked about?

Mr. GOHEEN. My own feeling is that if you have to mark out the places to start, the critical areas, one without any doubt is the graduate area and the other is the high school, in terms of academic programs here rather than scholarships.

May I say one thing about the Russian business so far as I understand it. One of the things they have done in the 10-year school is to insist upon excellence, upon quality; and they have remembered far better than we often have that intellectual excellence is furthered and developed best when you have relatively small classes and good equipment with which to teach. In other words, they are the ones who are retailing education, and I am worried that we are going into a wholesale operation.

Mr. UDALL. That is a very excellent statement of it. I am not inviting you to criticize the State institutions, but it has been called to our attention, and I saw it discussed in that very excellent CBS program last Sunday, that I think 24, which would be half of the State universities, as far as the high school graduates in their States, have no standards in the sense that anyone who has a high school diploma can get in. Of course, that means that they are preoccupied in educating numbers and it makes it particularly difficult for them to educate for excellence, does it not?

Mr. GOHEEN. I think it does; yes, sir.

Mr. UDALL. Your school, of course, is one in the country that has perhaps the very highest standards, and I wondered if you do not feel that some of the difficulties that we have in the field of higher education are related to that particular problem.

Mr. GOHEEN. I feel that indeed they are. This is one of the reasons why I think that every effort to get more able people into teaching is so important.

I would not, however, break this apart as a private university, public university problem. There are private universities which are educating wholesale, too, and there are great public institutions which are running wonderful honors programs in arts and sciences, really first-rate. These should be encouraged, I think.

Mr. UDALL. So that we are searching not only to strengthen the system, but to see that it has an emphasis on excellence and is a system that will produce excellence?

Mr. GOHEEN. Yes, sir.

Mr. UDALL. That is all I have.

I was reminded of this subject that we are discussing here when I read this morning in the press a statement that a German scientist apparently is on the verge of a discovery which might rival even that of Dr. Einstein, whose name is connected with your institution. It certainly does underscore, it seems to me, the need for emphasis on excellence and quality in our educational institutions.

Mr. GOHEEN. Yes, sir; I would agree.

Mr. UDALL. Thank you.

Mr. THOMPSON. Doctor, I think that the consensus of this committee is that we want to improve, from the kindergarten through the graduate schools in the best way we can, our educational system, its structure. For that reason we are considering very carefully the questions of early testing, guidance and counseling, which are so important.

Assuming that a well-balanced bill were written by this committee involving payment of scholarship funds or loan funds to students and money to colleges and universities for facilities and for caring for the students—

We realize that there is not a college student in the United States who does not have a scholarship and most of it is out of the faculty's hides.

Would you fear Federal control from such a program?

Mr. GOHEEN. I would not. I think I would not for the historic reasons that not only have our land grant universities been receiving Federal aid for a long time without any signs of suffering from Federal control, but in our whole development we have moved away from any situation where there were institutions that were entirely public-supported and those which were entirely private-supported.

My own institution is a private institution, and most of its funds are from private sources. At the same time, a large chunk of our budget is provided by the Atomic Energy Commission for certain services which we are rendering, and, as the Federal Government and our relations have developed here, we have found no problems of Federal control or pressure upon us other than budgetary ones.

Mr. THOMPSON. Thank you very much, Mr. Chairman.

Mr. ELLIOTT. The gentleman from Delaware, Mr. Haskell.

Mr. HASKELL. I, too, appreciate your very interesting testimony.

Of course, we are faced with the problem of trying to write a bill. You have very clearly stated my own thoughts, which I could not state half as well, of course, on the need and critical nature of the teacher weakness.

Now we are faced with a serious threat from the outside and other people who have testified before you and people who have not yet testified have indicated that something drastic has to be done in terms of getting teachers' salaries possibly doubled in order to compete in our economic society, to get the teacher in terms of social acceptance at the same level as our scientists and our business people.

If one were to really honestly face the threat in terms of how great it is, you would almost think that the Federal Government ought to walk in in a large way in terms of doing something about teachers' salaries if the local, State, or private sources are exhausted, as sometimes advertised.

Now, if we accept that, would you feel that the Federal Government could in a really major way, in terms of billions of dollars, walk in and do something in terms of raising the teachers' salary level, or do you think it should?

Do you think this would destroy in some measure some of our past history on how we financed education?

We are faced with this dilemma and I know you have thought of it.

Mr. GOHEEN. It is certainly a very difficult problem indeed.

My feeling is that there is no kind of direct subsidy which the Federal Government could offer to teachers or to this profession which would be very acceptable which would not have great dangers in it.

Mr. HASKELL. That would be danger in terms of Federal control?

Mr. GOHEEN. Yes, and in terms of inequalities.

It does seem to me that Federal aid or assistance of the types which are in the American Council's proposal have a very significant implication for teachers' salaries because they let the institution direct more of its own resources toward this problem as against some of the other things that it has to do.

Let me try to extend this by an illustration. I will take one out of my own institution. It could apply just as well to a public institution, however.

We have an excellent biology department, very good, in an obsolescent basement of a building. If this department is to make the advances in research, if it is to do the kind of educational job that it needs to do for young people, it has to have more adequate space.

Now, if I have to go out and raise the $2 million for this new building out of our existing resources, less of those resources are available for faculty salaries; but under the National Institutes of Health grant, if we can get half that money from the Federal Government

and acquire the other half out of our own resources, then this has saved us a good deal in our resources to put into faculty salaries.

This applies to a public institution just as much as to a private one.

Mr. HASKELL. As someone who went to Princeton also, I think you can raise money without too much trouble. I do not think this is true of necessarily all the other universities.

Mr. GOHEEN. The only thing is that to me your suggestion and those of the American Council of Education are here and there, but are they dramatic enough to really meet the critical situation which we suddenly find to have developed over many years? In other words, I have the feeling that laboratory facilities and here and there is not enough if we are to meet the doubling of students potentially to attend universities in the next 10 years.

Are we willing to face the really total need that is involved here? What you have presented still does not seem to me enough. It would be the easy way to do it. I would love to think that this was the way to do it.

I, of course, also believe that the institutions, again where public or private, have a real responsibility here and can themselves help to create the more dramatic impact that you suggest, if they can develop additional resources. I think they can.

Take the figures in the papers this morning about a 30 percent increase in the amount of private giving to colleges and universities in this country so that it is now up somewhere around $275 million which were contributed last year from private sources to American higher education. This has been moving way up. I think we can go up higher.

Mr. HASKELL. But in terms of a $16 billion expenditure on the total education in the United States, it is still relatively small. Is that kind of money able to flow mostly into teachers' salaries so that, instead of getting a 10-percent increase in teachers' salaries, can you get a 50-percent increase in teachers' salaries?

That is my question.

Mr. GOHEEN. I cannot answer it categorically.

Mr. HASKELL. Thank you very much.

Mr. GOHEEN. I would be worried about some kind of Federal action which not only said this was the most important problem, because it is the most important, but then implied that the Federal Government was going to take care of it.

One gimmick in here which is well worth considering, I think, is that which the Ford Foundation used in its grants for teachers' salaries; namely, to put in a bonus for those institutions which really were doing something on their own about this. This could be done to certain States, and so on.

Mr. HASKELL. Could I ask one thing?

The President's program, in my concept of it, really wants to bring science and mathematics up to the level where it was 10 years ago. I do not think Secretary Folsom or Under Secretary Perkins want to take the math and science teachers up above what they were before.

I think that if you raise the mathematics and science salaries above, it would create a demand to raise salaries in other areas. That is debatable. Some people think that would happen and have testified more or less that it would.

I do not think that you should necessarily condemn the motivation behind the President's program on that score, although it looks as if they are concentrating everything on mathematics and science.

On the loan problem, many of us on this committee have wanted to add this: If a loan setup such as saying that after the first year a student could receive a loan to pay back 3 years after he graduated at a reasonable interest rate were to be administered, who do you think should administer the program. Should the universities themselves administer the loan program or should it be a State authority, say something like the Massachusetts setup?

How would you prefer to have the administration of a Federal loan program?

Mr. GOHEEN. I have thought a lot about this. I think you certainly would have to have a central administration which might be regionalized, but then the final dealing with the student ought to be between the institution and the student because there are all kinds of things that come into this picture.

Just suppose a boy decides that he wants to be an engineer and he takes out a loan knowing that as an engineer he will be able to repay this later on; but by the time he has graduated he decides to become a minister. How is he ever going to pay back a loan as a minister?

The institution has to be ready to step in and help him out, and you cannot do this if all of your relations are between an individual and some great big impersonal outfit?

Mr. HASKELL. By the same token, if a female student gets married, she might not be able to pay it.

Mr. GOHEEN. Let her husband worry about that.

Mr. HASKELL. Thank you very much.

Mr. ELLIOTT. The gentlelady from Oregon, Mrs. Green.

Mrs. GREEN. First of all, let me say that I am delighted at the emphasis that you place on the humanities and social sciences as well as the physical sciences; also, that you emphasize that we need teachers of true ability and competence.

Mr. GOHEEN. Trained competence.

Mrs. GREEN. I am in complete agreement.

I do not know whether my memory serves me correctly, but I was disturbed by the individual who came and testified for the American Council on Education. I believe that in his testimony he set up certain factors that raised questions in my mind.

One, it was his recommendation that there be a State quota on the scholarships. Do you agree with that?

In other words, he suggested that it was not to be based on getting these youngsters of great intellectual ability, as we do in some of the merit programs, although I believe the national merit scholarship has a quota; but the main purpose would be, rather, to see that each State gets its share.

Would you agree with that?

Mr. GOHEEN. I would not agree with that. I do not believe it is in the written part of the proposal.

Mrs. GREEN. I believe it is.

Another recommendation was that if we go into a scholarship program, the American Council recommended that the scholarships be granted on the basis of geographical area, that the amount of the

scholarship would depend on the youngster going to a college that was adequate within his own geographical area. I specifically asked him if he meant that, for instance, a youngster of great ability in Portland, Oreg., who would make a very good scientist had ambitions to go to MIT, the scholarship would only permit him to go to a college within the Portland geographical area, and his answer was "Yes."

Mr. GOHEEN. This part of this proposal has worried me a great deal, Mrs. Green.

I might say, however, that there is a problem here. Our experience has shown with the merit scholarship program, with the Woodrow Wilson fellowship program, and with the National Science Foundation fellowship program that when young people get these prize awards and are given a free choice, they tend to concentrate on a very few institutions, when the fact of the matter is that equally good instruction is being done at many other institutions around the country. There are universities today which have great excellence in certain lines of work with too few graduate students in these lines, for example. It would be well if somehow we could direct more of the able students toward them.

On the other hand, I am worried about this thing which worries you, how you tell the really topflight fellow that he just cannot go to the topflight place, the very best place in his given field.

Mrs. GREEN. Is not the solution, though, for the colleges in the various geographical areas to bring up their standard of education rather than to say to the individual, "You cannot go there"?

Mr. GOHEEN. Some of them have very high standards already.

Mrs. GREEN. Some of them do not.

Mr. GOHEEN. That is right. I would agree with you.

Mrs. GREEN. I was disturbed at this testimony that was given by the representative of the American Council of Education.

Another matter that was discussed was the means test.

Do you think that financial need should be a basis or one of the criteria on which scholarships should be awarded?

Mr. GOHEEN. I would feel so strongly for a Federal program, especially with the other programs which are now in existence. Might I come back to the first question a minute to say that I spent 3 years directing the national Woodrow Wilson fellowship program, which is an effort to try to find, attract, and put into graduate training the most promising college graduates with the hope that they will go on to be teachers and scholars.

At the time I ran it, the program never awarded more than 250 fellowships a year, but we handled about 15,000 to 17,000 recommendations around the Nation. The problem of these nominees wishing to go to a very few institutions was very acute for us, and I had enough chances to get around the country and to interview lots of academic people to be quite convinced that in many cases these judgments which took boys from, say, the Midwest to the Ivy League institutions were just simply judgments of prejudice. They had nothing to do with what the academic excellence of the institution was.

I think this is what the American Council people are partly worried about, too.

Mrs. GREEN. I did not understand. You said you would favor the means test.

Mr. GOHEEN. On the means test; yes, I would.

Mrs. GREEN. Why?

Mr. GOHEEN. Well, I am convinced that there are a great many young people already getting scholarships who do not really need them, and I think the national statistics will partly bear this out. Indications as developed by Prof. Seymour Harris of Harvard were that in 1940 the average American family which had children in education was paying about 10 percent of its annual income toward education. Currently, it is paying only about 6.7 percent of its annual income toward education.

In other words, people are not paying as much for education now as they were 18 years ago.

Mrs. GREEN. Individually, we are not paying it as a nation then?

Mr. GOHEEN. That is right.

Mrs. GREEN. I have not heard anybody explain how you can work out a means test that would really accomplish the purpose in the example which I have given before: If you have two families and family X has been very thrifty and month by month has put aside money for the college education of the children in the family, they have a modest home and have it paid for, according to a means test they would not qualify.

Family Y has spent as they have received, and they have put nothing aside for education, and they have bought a home perhaps that has been beyond their means and perhaps not. Anyhow, it is not paid for and they have a big mortgage on it. According to the means test, they would qualify.

How can you justify this kind of procedure? How can you work out a means test?

Mr. GOHEEN. I think if you ask Mr. Chauncey these questions, he will be able to answer them a bit better than I.

We have all of our scholarship applicants or their parents fill out the forms which his shop provides, and on the basis of this, our staff tries to determine how much scholarship aid has to go to a given individual and to make the very difficult judgments which you put your finger right on.

Mrs. GREEN. Then, in addition, if you have a Federal program and we hear this hue and cry about Federal control, why would there not be a tremendous hue and cry if individuals and families, in order to qualify for a scholarship, had to bare all of the financial transactions of the family for the last many years?

Mr. GOHEEN. Well, we do this for income tax purposes.

Mrs. GREEN. Is not that a little bit different than a scholarship program? We do not hear the hue and cry against Federal control on income tax, or do we?

Mr. GOHEEN. Maybe I am a reactionary. I have never thought of myself as such, but it seems to me that one of the things we have to get over to the American people is that education is important and that good education is expensive, and that they have to make these choices: Are they going to pay for education or are they going to pay for new cars and other such things?

Mrs. GREEN. I am in agreement on that, sir, but I do not see how we can work out a means test; and, further, people have to defend the means test publicly, but off the record, I have had several that have been connected with these different scholarship programs, tell me they cannot justify the means test and that it does not work out.

Mr. THOMPSON. Will the gentlelady yield?

Mrs. GREEN. Yes.

Mr. THOMPSON. My feeling about the means test is that it does not go to the individual and his or her talents so much as it goes to the family, and for that reason it is unfair.

I see no reason why a gifted youngster of moderately well-to-do parents should not have the same scholarship opportunities as the gifted youngster of relatively poor parents, assuming, of course, that there is a broad enough program to educate these gifted people all down the line and to provide them with decent facilities and with decent teachers.

Mr. GOHEEN. Well, we have found having this financial information available on families very helpful to us in the fairly substantial scholarships and work funds which we allot to our applicants. We put out about $1,250,000 a year in scholarship and aid opportunities.

Mr. THOMPSON. I am familiar with the scholarship opportunities and work opportunities at Princeton. I think it can be said without fear of contradiction that they are among the best administered and the finest, but there you are dealing with private moneys in a private institution, and with students who have gotten themselves accepted by the institution.

I do not think that that is quite analogous to a Federal program. I think that a study of it would reveal that it probably would be more fair not to have a means test for Federal loans or scholarship programs.

Mr. GOHEEN. As I say, Mr. Chauncey ought to be much more expert on these problems than I.

Mrs. GREEN. I have one other question.

The American Council on Education, you say, recommends a tax credit. What good will this do the family that does not have money to begin with?

These are the ones who favor a means test and try to help the family not having money and then give them a tax credit, when they do not have income.

Mr. GOHEEN. It is not going to help those having incomes around the national average, which is said to be $1,500 a year or something like that; but there are a great many people in this country who have incomes higher than that and it seems to me that many of these people ought to be encouraged to pay for education, and that this is one way of aiding both private and public institutions to get their charges up somewhat closer to what education costs.

Now, I would see this as a kind of graded business so far as an institution is concerned, my own institution, but whether there is a Federal program or not, the boys from very needy families we will take care of, and we do. They do not have to have anything. The boys from middle-income group families, we would like to have them and their families put as much of their income into this as they can afford to, and the boys from very wealthy families pay the full freight.

Mr. THOMPSON. Thank you very much. I think that was a very fine statement.

Mr. ELLIOTT. The gentleman from New Jersey, Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Mr. Chairman, first of all I would like to express my regrets that I was not able to be here to listen to all the testimony of Dr. Goheen. As it happens, another subcommittee which I am a member of is meeting in the next room, and I have been obliged to be present at that.

I do think it has been an opportunity for all of us to hear Dr. Goheen this morning, and I hope he appreciates the difficulty we have been having in determining just where the Federal responsibility lies in this field.

Without having heard all your testimony, Dr. Goheen, I wonder whether you would care to comment, and forgive me if you have already stated it in effect, how important do you think any Federal program is in the field of education? Do you think, as an example, that it would be calamitous if no action were taken, remembering what has happened with previous suggestions that we provide some assistance in the construction of schools and the lack of success. It seems to me a possibility at least that no action will be taken even though there are a variety of ways, or even perhaps because there are a variety of ways in which we could help. Do you think it is a matter of great importance that we establish a Federal program of assistance or not?

Mr. GOHEEN. Yes, I do, Mr. Frelinghuysen. I tried to indicate that in my judgment there are very serious and widespread economic deficiencies within our whole educational system and higher educational system, and that we have got to make as a people an aggressive attack on trying to recognize these differences. We have to strengthen our system as well as bring more good young people into it. I feel that any delay here on anybody's part, whether it be the Federal Government or the local community or the business corporation, and so on, any delay in facing up to these problems is going to just let our system keep on deteriorating, because it has been deteriorating.

Mr. FRELINGHUYSEN. Of course, there can hardly help but be delay as far as the Federal Government is concerned, if the role is entirely new. There has been a tremendous amount of conservatism with respect to educational matters, and these are a very complex subject. There are so many different ways in which we can provide assistance, some of which come before this committee and some come before Ways and Means, or International and Foreign Commerce, or any number of committees. In many cases it may just boil down to the question of the amount of money: Are we willing to consider this as essential as the defense program ? That sort of argument. Almost inevitably so far as the Federal participation goes, there is going to be some delay and some hesitation to say the least.

I am just wondering whether the deficiencies can be handled without Federal participation in your opinion or whether you feel that part of the assistance must come from Washington, if we are going to get a correction of these difficulties.

Mr. GOHEEN. I would tend to feel that it must come from Washington, part of it, for two reasons: One is the need for dollars, out in the field, out in the institutions. The other is the effect on the public

psyche, if you want. Whether we like it or not, things have become more and more centralized in this country, and what the Federal Government does or does not do, what it says or does not say, has ripples all out through the country.

It would seem to me that if the Government—the Congress—should not say that education is important, that we have got to do something about it, it will help to prolong some of the lethargy which we have already out in the other areas—in areas of the country.

Mr. FRELINGHUYSEN. Specifically, and I do not know whether you mentioned this in your early testimony, how important do you think it is for the Federal Government to encourage improved methods of teaching foreign languages? Do you think that is an area where psychologically we might provide some of the leadership in correcting serious inadequacy, or do you think that is an area we might better leave alone, or it is not essential for us to bother about it?

Mr. GOHEEN. This is a difficult question. The Modern Language Association and many people not in that association have been working very hard, especially since World War II, to improve the methods of foreign language teaching and the supply of qualified teachers and the whole interest in this subject. We have made some headway. It seems to me we have not made nearly enough headway, and these things again cost money. It is very hard for an institution to say, "We will set up a special kind of institute for oriental languages," let us say, with all the other things which it has demanding its attention.

I feel that the proposal to establish language institutes comparable to the science institutes is a good proposal and a valid one. I do not look on it as a humanistic proposal. I look upon it as something to meet one of our national needs, namely, our scarcity of people who can deal with the peoples of other nations in their own languages.

Now the National Science Foundation, institutes in sciences and mathematics, seem to me beyond any question, to have had a very significant, positive impact upon science teaching, and we would hope that something of this sort might occur in the language area, too.

Mr. FRELINGHUYSEN. I have no further questions, Mr. Chairman. I think the testimony has been very helpful to us.

Mr. ELLIOTT. The gentleman from Massachusetts, Mr. Nicholson.

Mr. NICHOLSON. Do you believe that the Federal Government can educate the young people in this country better than the neighbor next door who has to foot the bills?

Mr. GOHEEN. No, sir. As I tried to indicate in my testimony, I feel that the primary responsibility lies upon communities, upon institutions and the people directly connected with institutions. These are where the primary responsibilities lie.

I also indicated my conviction that these sources and these people cannot do the job alone. I think we have seen this already in the growing economic deficiencies of our school and college and university systems, which, of course, are aggravated by the dynamic growth of our population in the younger age groups.

Mr. NICHOLSON. Do you have any idea how far the Federal Government has gotten into the things which were supposed to have been done by the States and the communities?

Mr. GOHEEN. Yes, sir.

Mr. NICHOLSON. How much money do you suppose that we are obligated now to help out this, that, and the other thing?

Mr. GOHEEN. I do not know, sir.

Mr. NICHOLSON. In order to come before a committee and say that the Government ought to appropriate a billion dollars for better or different kind of schooling you ought to know where that billion dollars is coming from.

Mr. GOHEEN. Mr. Nicholson, I did not mention dollars anywhere along the line because it seemed to me this was beyond my competence. I tried to outline what seemed to me to be the problems and say that I felt that as I looked at the picture institutions and communities were not going to be able to solve these problems out of their own community record.

Mr. NICHOLSON. It is a difficult thing for me and a great many other people to tell what is propaganda and what is not propaganda.

Mr. GOHEEN. Yes, sir.

Mr. NICHOLSON. From what I know and from what I have observed, I have not seen where Russia or any other country, for that matter, have invented as many things as we have in the last 50 or 100 years. As far as I can find out most of these things were done by people who lived in the United States. They may not have been born here, but they at least brought forth all of these inventions that apparently only a scientist can do, but so many of them were not scientists. Some of them did not graduate from high school even, that have invented these things that have made it so easy for us to live.

Now, I understand that the Federal Government pays between four and five billion dollars to the cities and towns for one thing and another. Every once in a while the Federal Government steps in and says, "We will pay half of this, not that we will do the job any better or as well, but we will pay half of it," and then you put an army of people at work.

We have 2½ million people working for the Federal Government which is beyond my comprehension why we should do it. Well, for instance, take aid to dependent children, old-age assistance. The Federal Government steps in and says, "We will pay half of it." Why? Were we not able to do it at all in the local community where it had been done since 1620? Is there something magic about the Federal Government that it can do things better than the man that is right close to the problem next door to him? Or have we got to hire somebody down here in Washington to set up certain standards and rules and so forth and so on because they are appropriating money for it?

Mr. BAILEY. Will the gentleman from Massachusetts yield?

Mr. NICHOLSON. I yield.

Mr. BAILEY. The difference is that the Federal Government sometimes does things and the States do not do them, and that is why we have this situation.

Mr. GOHEEN. I believe, sir, very strongly as I tried to indicate, in the responsibilities of institutions, communities, and private groups in education as in other things. I would certainly regard it as tragic if these groups felt that they could dodge their responsibilities, felt that they themselves did not have to dig a lot deeper into their pockets for things that they approved of for their communities or for their institutions.

It, however, also seems to me that with the type of complex, technologically based society which we have evolved there is a hunger in this land for highly educated manpower and highly skilled manpower, which hunger will grow, which needs will grow. And I do not believe that our communities are going to be able to meet this kind of demand unless they have some aid from the Federal Government as well as from all other sources that they can tap.

Mr. NICHOLSON. Of course, you realize that whatever money we appropriate here comes out of the same pocket.

Mr. GOHEEN. That is right.

Mr. NICHOLSON. It is just the question of who is going to spend it so far as we are concerned because we only make so much money, and we take a certain percentage of it for schools, and we take a certain percentage of it for public welfare and health, and so forth and so on. Now, it only just comes out of one place that is all, and the question is whether there is enough money left in that pocket to take away from us.

I do not know just how much I had to pay for income tax to the Federal Government. I know it is a stiff amount. And when I consider when I go home and find that my town operates a police department, takes care of the sidewalks, builds the roads, takes care of all kinds of public welfare, and does it by getting its money out of the house and lot that I own in the town, but they like me——

Mrs. GREEN. Will the gentleman yield?

Mr. NICHOLSON. Yes, I will yield.

Mrs. GREEN. For years, both at the State level and national, I have heard complaints about the amount of taxes we paid for schools. In Oregon they are almost entirely supported by local property tax and some State tax now.

We on several occasions added them up and I would have to say that the total tax that is spent on schools was not equal to anywhere near what a babysitter would cost. This is true for the average family. You could not begin to hire a babysitter who would just sit there without any training, without any educational advantages, for what you pay for your taxes at the local and State level to the educational program for more than one child.

Mr. NICHOLSON. Well, Mrs. Green, I can say that no one in my town's town meeting when we appropriate the money to operate the schools in the town kicks about it. I am not kicking about it certainly. My town spends about well over a third of all the money we raise to operate the town, a third goes to education and more than a third or at least a third goes to public welfare, so that two things take up 66 percent of our taxes, public welfare and education.

Mrs. GREEN. Your community is indeed to be congratulated. It is the first community that I heard of in the United States where the people do not complain about the taxes they spend on schools.

Mr. ELLIOTT. Dr. Goheen, I would like to ask you two questions now. Perhaps they are by way of summary.

You have indicated that you felt that a needs test should be included in any scholarship program. Do you feel, therefore, that such a scholarship program will bring students into school who cannot get there otherwise?

Mr. GOHEEN. I think it can certainly help to bring students. I believe that the main instrument here lies in guiding and counseling in the schools, and I do not believe either that it lies in professional counselors as much as I think it should lie in the hands of the teachers who we should encourage to be a little bit more aggressive and take more of a responsibility about this. The person who knows the quality of mind of the student is his teacher, and he is the one who can persuade him and guide him.

Mr. ELLIOTT. I want to say that that statement with respect to counseling and guidance is certainly in line with my own feelings in the matter.

You indicated a few moments ago that many, many scholarships are today going to people who otherwise would go to college.

If we set up a system of scholarships that sends people to college who could otherwise go on their own, then it seems that we might be cutting down on the overall number of bright boys and girls who could obtain the benefits of education through the scholarship program. I say that even though the bill that I am sponsoring provides that the scholarships be given more or less as a prize and without repayment and without reference to the financial standing of the family or the parents of the particular student involved.

Then my bill has a loan program which provides that loans will be repaid with 2 percent interest over a period of 10 years, beginning 1 year after graduation. I feel that that program will do a great deal toward enabling worthy students to go to college. I would like to ask your judgment about this phase of the loan program. What degree or state of proficiency should we require of the student who has a loan?

Mr. GOHEEN. To get a loan?

Mr. ELLIOTT. Yes and to keep it and renew it or to get an additional loan for the next year, assuming he has had a loan for 1 year already?

Mr. GOHEEN. Well, I would say that ability to gain admission to an accredited institution of higher education and the ability to maintain passing grades within that institution. I do not think that the standards for loan ought to be any higher than that, because as I would see it the loan principally is to enable young people to have a college education even though they may not be the very brightest. We need the very brightest, but we need a lot of just able people, too. The scholarship principle I would think of as applying more to those of marked high talent.

Mr. ELLIOTT. Dr. Goheen, my bill has a work-study program involved in it in one of the titles. Assuming we set up a work-study program to be contributed to by the Federal Goverment and by the States, should such a program be administered wholly and completely by the institutions participating in the program?

Mr. GOHEEN. Mr. Elliott, I am afraid I have not done my homework well enough to answer this, and I am not exactly sure what you have in mind by work-study, if this is a kind of in-and-out scheme where you are in college for a term and out working for a term, or our kind of scheme where we expect almost or as a matter of fact most of our scholarship people to also take some work jobs because we think it is good for them.

Mr. ELLIOTT. It is more your type scheme. What I envisoned was a student might obtain a job within his field and work while in college

and earn some money with which to pay his expenses. I had hoped that we might refine that program to a point where a student would be engaged in jobs that might contribute to his own growth as well as be beneficial to the institution itself.

Mr. GOHEEN. I think this is an extremely good principle. I would think that it would have to be administered certainly through the institutions which are the ones who know the boy and his capacities and his interests and so on.

Mr. ELLIOTT. And you have indicated that you feel that the basic unit of administration should be the institution also?

Mr. GOHEEN. Yes, because I think there will always be lots of personal variables in here, and we certainly, it seems to me, in education have to open every avenue, to give every break, to the person who is going to go into one of the service professions with very little renumeration.

Mr. ELLIOTT. Thank you very much, Doctor. Your testimony has been very helpful, and we appreciate your kindness and consideration.

Mr. GOHEEN. Thank you, Mr. Elliott.

Mr. ELLIOTT. Our next witness is Dr. Henry Chauncy, president of the Educational Testing Service, Princeton, N. J.

I am going to ask a member of our committee, the gentleman from New Jersey, Mr. Thompson, in whose district the witness lives, to introduce him to the committee.

Mr. THOMPSON. Thank you, Mr. Chairman. This seems to be Fourth District of New Jersey day.

I am not only pleased but extremely proud of these distinguished constituents, and I know that all of the members of the two subcommittees will be pleased to hear them. Dr. Chauncey is accompanied today by Mr. John Dobbin, and we would like permission for Mr. Dobbin to assist Dr. Chauncey as he sees fit.

Mr. ELLIOTT. Without objection, he may.

Mr. THOMPSON. And to make himself available.

Dr. Chauncey heads a distinguished organization and is himself a distinguished scholar. I might point out that Educational Testing Service does work which Mr. Chauncy can describe better than I for educational institutions throughout the land, and it is in fact a nonprofit organization. So his contribution here is doubly appreciated by me since in the truest sense of the word there is no ax to grind except for better education throughout our whole system, and with that I will not intrude further on his time.

Mr. ELLIOTT. Thank you, Mr. Thompson.

Mr. Chauncey, you may proceed. Each member of the committee has a copy of your statement, and you may read or summarize it as you see fit.

STATEMENT OF HENRY CHAUNCEY, PRESIDENT, EDUCATIONAL TESTING SERVICE, PRINCETON, N. J., ACCOMPANIED BY JOHN E. DOBBIN, DIRECTOR, COOPERATIVE TEST DIVISION

Mr. CHAUNCEY. Thank you, Mr. Chairman.

In view of what I guess may be a shortage of time, I will attempt to summarize.

I greatly appreciate the privilege of appearing before your committee and discussing some of the issues that are under consideration.

I am appreciative of the responsibility that goes with this privilege and the vital importance of the subject under discussion today.

The strengthening of our educational system, it seems to me, is of the first importance, and I know that your committee has heard a good deal of testimony to indicate this earlier; but, having sat in the back of the room during the earlier testimony, I feel somewhat impelled to indicate my personal conviction that this is vital to our existence.

Russia has made tremendous strides, as everyone recognizes, in the work of its scientists, its economic development, and in its military power.

Mr. ELLIOTT. Dr. Chauncey, let me interrupt you right there. Do we have any knowledge as to what types of testing that the Russians may be doing in their 10-year schools comparable to our high schools?

Mr. CHAUNCEY. Yes. We have some knowledge. In fact, they do not use testing as we understand testing.

Mr. ELLIOTT. I saw some figures very recently that said that Russia was graduating from her 10-year schools as of last year 1½ million students per year, and we graduated last year about 1,300,000 from our high schools. That being true, if the Russian figures are approximately correct, it seems that the Russians are doing quite as big a job of mass education as we are doing.

Mr. CHAUNCEY. And Mr. Goheen indicated in his testimony that they are putting emphasis on quality as well.

Mr. FRELINGHUYSEN. Mr. Chairman, if I might interrupt very briefly again because I do not think it is fair to the witness to have these long dissertations.

Mr. CHAUNCEY. It is all right.

Mr. FRELINGHUYSEN. You started right off by stressing how vital it was that we strengthen our educational system. A lot of witnesses say the same thing, and, of course, we are anxious to improve it if we can. What I am wondering is if this is a belittling of the present achievements, whether it is a serious worry about our own ability to cope with our present problems with the present system. In other words, we have a pretty good system, have we not? What is so vital about strengthening the present program?

Mr. CHAUNCEY. Mr. Frelinghuysen, this is the subject of my remarks, in effect. So may I come in with this as I go through?

Mr. FRELINGHUYSEN. Yes.

Mr. CHAUNCEY. Because I believe we have an excellent educational system that has done remarkable things but has to do even more remarkable ones in the period ahead.

The Russian system does have the advantage of bringing through uniformly their ablest individuals, partly because of the kind of control they can exert and partly because of the incentives they have at the far end. The scientists and teachers in Russia are being paid among the highest salaries instead of the lower salaries that we are accustomed to recently in this country.

But to me the whole problem of our situation vis-a-vis Russia can be epitomized in a very simple graph. If you can imagine a graph like this, with our educational system improving steadily, going up like this, and then their educational system and in fact the whole strength of their society starting at a lower level, 30 years or 40 years ago, and coming up at a more rapid rate. We are not yet at the meeting point. The meeting point is probably still 5 years away.

If we do not change the level of our line, we are going to find as certain as anything that they are ahead of us.

Mr. FRELINGHUYSEN. What does the line represent? Does it represent the number of young people or quality of their product? What does the line represent?

Mr. CHAUNCEY. The line can represent the total strength of educated manpower if you want to put it that way.

Mr. FRELINGHUYSEN. Do you think this is a number race?

Mr. CHAUNCEY. No, it is strength, including quality in it. I think you have to have numbers and you have to have quality. They are both important, I think.

Mr. FRELINGHUYSEN. How would you measure your quality on a graph? Is it number of Ph.D.'s? Do you mean we must increase the number of Ph.D.'s? I do not mean that as a trick question.

Mr. CHAUNCEY. We have to improve the quality of the education of all our youth from those who are least able in academic ways to those who are most able in academic ways.

Mr. ELLIOTT. In proportion to the population, Russia is graduating as many people now as we are. They have 200 million people, and we have 160 million. They are graduating 1½ million; us a million three hundred thousand. What about the quality of their education? Assuming in the mass they are doing as much as we are doing, is the quality as good as ours or better? I understand that they require much more foreign language than we require and they require more sciences and mathematics.

Mr. CHAUNCEY. Mr. Chairman, I am not the best person to give testimony on the quality of their education. There are others who have studied this much more thoroughly than I have. The impression I get from what I have read is that their quality generally is good, but I would not be concerned too much about measuring the quality of a particular subject taught in Russia as compared to the quality of a particular subject taught here.

What I am concerned about is what they have accomplished in Russia when they began at scratch in 1917 and we began way far back. It seems to me that these two lines of the graph are the pointers to the critical years ahead and that this has to be taken cognizance of.

Mr. NICHOLSON. I do not want to interrupt, Mr. Chairman.

Mr. CHAUNCEY. That is all right.

Mr. NICHOLSON. I am like the rest of them. But I want some light on the subject. And I want to know if you know why we have fallen down in method of education, let us say, in the last 25 or 30 years. Now when I went to high school, which was probably 50 years ago—it was 50 years ago—these things we were required to take: Mathematics; some language, either Latin or Greek, French, or German; history; and English. All those things were required.

Now then, who is to blame for it? Is it the educational system? Is it the head of the educational system in Washington, or the one in the statehouse in Massachusetts? Or who is to blame for it then? You certainly cannot say we did not give the children 50 years ago an excellent opportunity for education anyway.

Mr. CHAUNCEY. Mr. Nicholson, I do not think it is a matter of blame. I think as I said a few minutes ago that our accomplishments have been quite remarkable. But during the past 25 years, or maybe

a little longer than that, there has been an emphasis on having all students carried through high school, and those who had the problem of teaching all students who range in ability from barely able to understand the things that are taught in high school to the genius at the other extreme, have had to be taught together and it has naturally resulted in many cases, not in all cases, in a modification of the curriculum to suit the average.

Now the pendulum is swinging very rapidly, I am happy to say, at the present time toward giving a suitable education to the academically talented who are so important in our society and being sure that they are not being neglected in favor of the average or the below average.

But I do not think there is any one person to blame. There is no scapegoat here. This is a situation we are faced with, and the problem is what can we do about it.

Now, the second point I would like to make is that although I stress Russia right at the outset, these things that we are thinking of doing, it seems to me, are exactly the things that we ought to be doing in order to strengthen a democratic society.

The only difference in the situation that Russia creates is that it makes the whole thing much more urgent. We could take this on a more gradual basis. We could be less concerned with the problem of whether the Federal Government should get into the act or should not get into the act if there was no Russia in the situation. But with Russia in the situation the Federal Government has a responsibility. The Federal Government has the responsibility to insure the defense of the United States, and it is going to be neglecting that responsibility as of 5 years from now if immediately there are not steps taken to make sure that we strengthen our educational system to the utmost.

Mr. BAILEY. Will the gentleman from Massachusetts yield? I would like to inquire——

Mr. NICHOLSON. I was all through. I am satisfied.

Mr. BAILEY. I would like to ask the Doctor a question at this time.

The situation in the United States as far as our educational efforts are concerned and Russia is quite different. I am wondering if the Doctor has an answer to the question as to what would happen to a group or university in Russian society who, for selfish reasons, in an effort not to pay taxes would take advantage of a feeling on the part of the general public, that education was a matter for the State and the local district and defeat any efforts on the part of the Federal Government because of Federal interference in education. Do you not imagine that group or university in Russia would be sent to Siberia into the salt mines? I am speaking now about the Chamber of Commerce and the American Association of Manufacturers, and a few more of them, who for purely selfish reasons for avoiding paying taxes, take the part of the feeling on the part of a lot of Americans that it is the business of the local district and the States to carry the schools. I wonder what would happen to those folks over in Russia.

As you understand, I am just mentioning this picture to show the situation is quite different here than it is in Russia, and we are going to have to have some revision of our thinking here in this country if we meet this situation. Am I right about that, or am I talking incorrectly?

Mr. CHAUNCEY. Mr. Bailey, I think you answered your question really, but I do not know the situation as to how it happens in Russia.

Mr. ELLIOTT. Will the gentleman from West Virginia yield?

Mr. BAILEY. Certainly.

Mr. ELLIOTT. I believe that Dr. Chauncey is a bit confused by the fact that he does not feel that Russia has a Chamber of Commerce or NAM.

Mr. THOMPSON. Or they might send them to the equivalent of West Virginia.

Mr. BAILEY. That was unnecessary.

Mr. THOMPSON. Mr. Chairman, may I ask the Doctor a question?

Mr. ELLIOTT. The gentleman from West Virginia has the floor.

Mr. THOMPSON. Will the gentleman yield?

Mr. BAILEY. Yes.

Mr. THOMPSON. The time is running short, and I am particularly anxious to have the members of the committee, particularly the chairman, have your views on the value of testing, the value of guidance following the testing, and your opinion as to the scope of a program, whether it should emphasize mathematics and science or whether it should be more all-inclusive.

Mr. CHAUNCEY. May I run rapidly through the statement?

Mr. BAILEY. Just a minute, please. I am going to yield the floor. The gentleman from New Jersey could have saved a minute of time if he just leaned over and said, "Do not ask any more questions."

Mr. ELLIOTT. You may proceed, Dr. Chauncey.

Mr. CHAUNCEY. Gentlemen, if I may, I will proceed to go very rapidly through this. Mr. Frelinghuysen asked if in this country we have not been doing well enough and how we should be doing better. My answer is that we have emphasized a slogan of "Education for All." This has been a fine slogan. We have accomplished this in a sense. What we need is a higher goal that might be phrased "education for each individual that will bring about his full development." If we can achieve this goal, we will not only strengthen our country and strengthen its leadership in science and technology and in other ways, but we will be fulfilling the democratic ideal of a rich and rewarding life for each person.

The two bills that are principally under discussion here have seemed to me to be excellent, and I am perhaps a little bit biased because of certain similarities of some testimony that I gave before the Subcommittee on Research and Development of the Joint Committee on Atomic Energy a couple of years ago, and I stressed at that time four points that seemed to me to be particularly important, and I would like to stress them again today.

The first is the early identification of able students. The second is the strengthening of guidance based on the identification and the guidance of all students. Thirdly, the improvement of education through the use of modern technological developments. We need more teachers, we need better teachers, but we have to look at modern technological developments such as sound films and television which hold real problems and enable us to do a far better job than we had in the past.

Mr. ELLIOTT. As aids to good teachers?

Mr. CHAUNCEY. As aids to good teachers. That is a story as to how you best use them, but I will not go into that now.

And the fourth point is a substantial Federal scholarship program.

Mr. ELLIOTT. Now, Doctor, right at that point, what are American high schools today doing toward the identification of bright youngsters and for all youngsters toward the identification of their abilities?

Mr. CHAUNCEY. There is an increasing effort on the part of schools, junior high schools, 8-year elementary schools at the end of the period there, the beginning of high school, to identify the abilities of students. But we have only made really fairly small progress in this matter.

Mr. ELLIOTT. The progress of the past 20 years has been relatively small, has it not?

Mr. CHAUNCEY. At this point.

Mr. ELLIOTT. At this point?

Mr. CHAUNCEY. At this point, and I am talking about the 7th, 8th, and 9th grades. Much of the testing that has been done in the schools has been at the 11th- or 12th-grade level, which is locking the barn door after the horse has gotten away. At least, you cannot effect some important decisions if you wait until that time.

Mr. ELLIOTT. For good guidance your guidance program is of little value if you wait until the 12th grade, is it not?

Mr. CHAUNCEY. That is correct. It has to start early. Ideally it should start way back in the early years of elementary school and be a continuous process, but the critical point comes somewhere around about the seventh, eighth, or ninth grade.

Mr. ELLIOTT. The gentlelady from Oregon.

Mrs. GREEN. Again, I am in agreement with your statement about the early identification of able students. You and Dr. Goheen both put emphasis on the necessity of competent teachers. Is it not another equally important key, the early identification of the capable teacher, the career teacher? I do not know what the answer is, but giving across-the-board raises to every teacher in the system and not identifying early in that individual's life whether or not he is going to stay in the teaching profession and whether or not he is going to be one of the best qualified is a problem. What can we do in that area?

Mr. CHAUNCEY. I thoroughly agree that we need some system that will permit the rewarding of the really promising, able teachers and not have all teachers progress on a basis of a raise of so much every year no matter whether they are good, poor, or indifferent. The problem of merit rating is a complicated one, and one that has so far baffled the school systems, I think, that have attempted it. Here again I am not a specialist in this particular field. I think there is the possibility of developing new classifications of teachers which would carry with them larger scholarships, such as master teachers, department heads, and so forth, so that you can perhaps reward the ablest teachers well fairly early. But this is an important problem, but not one that——

Mrs. GREEN. Are we not really going to have to solve this as well as some of the other problems before we can make real progress?

Mr. CHAUNCEY. I would feel so.

The reason that this early identification is so important is that it is at the beginning of high school that certain critical decisions have to be made, that students have to decide whether to go into the academic course or the commercial course or the vocational course or

whatever it may be. Such a decision affects whether or not a person will go to college or if he goes into higher education what kind of institution he can go into.

Now another important decision is whether or not to continue mathematics. Many students drop mathematics about the 10th grade; and, if they later find that they have scientific talent, they are blocked from going into the scientific field for lack of mathematics.

There are facts to indicate what our wastage is here, and it is very considerable. We made a study a couple of years ago for the National Science Foundation on the college-going plans of high school students and found that of the top 30 percent of the students in a senior class only two-thirds of the boys and just about half of the girls were in a college preparatory program. In other words, one-third of the boys and half of the girls slipped out of the college preparatory program at some point as they were going into or through high school.

And then still speaking of the top 30 percent, only 70 percent of the boys and 40 percent of the girls took more than 2 years of mathematics. In the end, only 60 percent of these able boys and 46 percent of these able girls went on to college.

Mr. ELLIOTT. Say that figure again, Doctor.

Mr. CHAUNCEY. Sixty percent of the boys and 46 percent of the girls who were among the top 30 percent of the high school seniors.

Mr. ELLIOTT. In other words, only——

Mr. CHAUNCEY. About half.

Mr. ELLIOTT. About half?

Mr. CHAUNCEY. Just a little over half.

Mrs. GREEN. May I ask a question?

Mr. ELLIOTT. Yes.

Mrs. GREEN. A couple of weeks ago in a Sunday weekly, some man wrote an article in which he recommended that the problems in education would be solved if we cut down the number of women who went to college. Do you agree with that?

Mr. CHAUNCEY. No.

So it is obvious to me that there is a tremendous waste of our human resources and that whether or not we increase the size of the higher educational system throughout the country we ought to get the ablest students going on to college. We do need to identify them early and encourage them to go on.

Actually, I am referring to some extent to Mr. Goheen's remarks here, the higher educational system is going to have to expand whatever happens. I mean even if we do not do this, there are more people wanting to go to college every year, there are larger age groups coming along, so something has to be done to rescue the colleges. So far as I am concerned they cannot solve their problems by themselves. Princeton may be in a more favored position to do that than many another institution. But there has to be help not only for identifying and giving a good education at the high school level and then giving scholarships to help the students through but there also has to be help given to the colleges to do a first-rate job so that the students as they come out are developed to the fullest extent.

Mr. ELLIOTT. In your scholarship program, your point No. 4, would you include loans in that?

Mr. CHAUNCEY. I think the program in your bill, Mr. Chairman, is excellent in that regard. And I like particularly the provision that those who go into teaching would be exempted from repayment of the loan, 20 percent for each year of teaching. This is a plan that has been in operation in Australia for a good many years and has worked out very satisfactorily and certainly would be an incentive to many people to go into teaching it would seem to me. To put it the other way around, there would not be the deterrent of going into teaching, of having the loan hanging over the person's head that he had to pay out of a relatively small salary.

If one is going to select students or identify the academically talented students at the eighth- or ninth-grade level, I do want to emphasize again that I think this identification at that point is for the benefit of all to make sure that all students get into programs that are appropriate for them. But in the context of looking toward the scholarships that are going to be awarded later we are particularly concerned with the academically talented, which are such an important resource in this country.

In the process of identifying who are the most academically talented, the bases which have been time tested by colleges and by industrial scholarship sponsors and by Government in such programs as the NROTC is a combination of the school record and usually the rank in class in school is the best index of it and academic ability test and ratings by the principal and teachers who know the student personally best.

These three things can be combined to provide a basis for guidance at the 8th- or 9th-grade level and to provide a basis for a scholarship award when one gets up to the 12th-grade level.

Mr. THOMPSON. Mr. Chairman, may I ask one question?

Mr. ELLIOTT. Yes.

Mr. THOMPSON. Doctor, do the tests take into account with any degree of accuracy the different standards of the educational institutions in the school districts? In other words, can the student who has native ability and talent be discovered by testing notwithstanding that his school might be not as good as the next one.

Mr. CHAUNCEY. Tests have frequently discovered individuals who were not discovered by the way they were handling their schoolwork or by the presumed quality of the school. The rank in class in school or the school record is affected by the standards of the school, by the standards of individual teachers in their grading, by differences in grading system, by any disciplinary element that may get into the grades, by whether the person has really been inspired to do his best or he is so able that he has been bored by the kind of program he has been faced with.

The tests, on the other hand, give a comparable basis for comparing all students. Now, the school record, on the other hand, is something that really measures a great many different qualities that are involved, his persistence as well as ability, and it is a measure of how the fellow has done over the hills and dales of a cross-country run and that is important. The test, on the other hand, tends to measure his springing ability and you get a few slants on him from that. The two used together provide the strongest basis of predicting how well a person will do in the future.

Mr. ELLIOTT. Let me interrupt right there, Doctor, the information you are bringing us is, as far as I am concerned, very, very fine. I would like to hear some more of it. But it appears that it will be about 4 o'clock this afternoon before we would be able to hear you again. Would it be feasible for you to stay until 4 o'clock?

Mr. CHAUNCEY. Yes, sir.

(Discussion off the record.)

Mr. ELLIOTT. Let us say that we meet again here at 4 o'clock this afternoon, and from 4 we will start hearing you then because the information that you have is very fine and very helpful.

Now, in our audience also at this time is Dr. Clark A. Dunn. Dr. Dunn has a statement of the National Society of Professional Engineers.

Dr. Dunn, as I understood you would like to file that statement to be made a part of the record following the testimony of Dr. Chauncey; is that correct?

Mr. DUNN. Sir, I would like a chance to testify if possible. If that is not possible, then I would like to file it.

Mr. ELLIOTT. Suppose if it is possible then can you meet with us at 4 o'clock this afternoon?

Dr. DUNN. I shall be glad to be here.

Mr. ELLIOTT. If we have an opportunity, you will follow Dr. Chauncey.

Mr. DUNN. Thank you.

(Whereupon, the subcommittees recessed at 12:10 p. m. to reconvene at 4 p. m. the same day.)

(The members of the subcommittees were unable to convene in the afternoon session, due to pressing business on the floor of the House of Representatives; therefore, the prepared statements of Henry Chauncey, president, Educational Testing Service, Princeton, N. J., and Clark A. Dunn, vice president, National Society of Professional Engineers, follow:)

PREPARED STATEMENT OF HENRY CHAUNCEY, PRESIDENT, EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.

Mr. Chairman, I appreciate greatly the privilege of appearing before your committee and discussing some of the issues that are under consideration. At the same time, I am conscious of the responsibility that goes with this privilege and the vital importance of the subject under discussion.

The strengthening of our educational system, remarkable as its achievements to date have been, is crucial to the welfare and security of the country.

You have heard from other witnesses of the vast strides the Russians have made in the education of their people and of their remarkable progress in science and technology.

It is generally believed that they have not yet caught up with us, but their rate of progress is such as to threaten our leadership in the next 5 to 10 years. We have got to set our sights higher in our educational goals if we are to maintain our position. And this means we have got to do even better than the slogan of "education for all," which has largely been accomplished, and achieve the more difficult goal of "education for each individual that will bring about his full development." If we can achieve this objective, we will not only maintain our position of leadership in science and technology, but we will be fulfilling the democratic ideal of a rich and rewarding life for each person.

The various proposals you are considering—those that are included in your bill, Mr. Chairman, and in the administration's bill—all seem to me well chosen to make our educational system more effective. Perhaps I am biased because of the similarities to certain proposals I made 2 years ago before the Subcommittee on Research and Development of the Joint Committee on Atomic Energy.

At that time, I stressed the importance of early identification of able students, the strengthening of guidance, the improvement of education through the use of modern technological developments, such as television and sound films, and the initiation of a Federal scholarship program. All four of these approaches to the improvement of education are, I believe, under discussion. I personally hope that they will all be included in the final bill, because they are interdependent and together make an effective program.

You have under consideration other proposals for summer school courses for teachers, for science teaching facilities, for graduate fellowships, etc. Each of these has an important place in strengthening our educational system.

However, I shall restrict my comments in this prepared statement to the matters on which my experience has given me a modest degree of competence: early identification of abilities, guidance, and scholarships.

If we are to bring about the full development of each individual, it is essential that we identify the abilities of each student early and make available to him educational opportunities suitable to these abilities.

That this has not been accomplished in the past is made clear by the results of a study we made for the National Science Foundation on the college-going plans of high school students.

Of the top 30 percent of the students in the senior class, only two-thirds of the boys and just over half of the girls were in a college preparatory program. Only 70 percent of the boys and 40 percent of the girls took more than 2 years of mathematics. Let me repeat, I am speaking of the top 30 percent of the students, not all of them.

In the end, only 60 percent of these able boys and 46 percent of these able girls went on to college, and many of them did so without the appropriate kind of college preparatory courses of study.

If we are to help students choose appropriate courses of study, their abilities must be ascertained not later than the eighth or ninth grade. It is at this point that critical educational decisions have to be made—such as choice of curriculum, whether to take an academic, commercial or vocational program, and whether or not to continue mathematics. And these decisions will have to be made, with or without the information for making them wisely. An academic ability test together with school grades provides the best basis for estimating future achievement. School grades are important, of course, but alone have certain limitations. Marking systems and standards of grading vary from school to school and teacher to teacher. Grades may be affected by a disciplinary element. Furthermore, the student may have worked hard or he may have been bored.

Aptitude tests, on the other hand, provide a comparable set of observations of pupils that are unaffected by these influences. They provide another, and an independent, view of the student. There is, of course, greatest probability of success for pupils who rank high on both predictors—both grades and aptitude test scores; a somewhat lower expectancy for those who rank high on one but not on the other; least for those who rank low on both. Each predictor, however, identifies some future high achievers who are not identified by the other.

The use of tests in schools has a relatively long history going back roughly to World War I. During recent years there has been a steady growth in the use of tests. Nevertheless, there are still many schools that make little or no effective use of them as aids to better guidance.

In order to extend the use of tests and increase their effectiveness, a number of States have embarked on State testing programs. Some of these programs have been in operation for as long as 20 years. About half the States have a testing program of one sort or another. But most of these testing programs provide for testing at the end of high school, at the 11th- or 12th-grade level.

It is only very recently that the importance of earlier testing for guidance has led to the establishment of a few State programs in which tests are administered at the eighth- or ninth-grade level.

Minnesota, which for many years had had a 12th-grade testing program, recently added a program at the 9th-grade level. Florida last year initiated statewide testing at the same level. Delaware and Wisconsin are running pilot programs aimed at statewide testing at this level. Georgia recently appropriated funds for a comprehensive program of testing and guidance covering grades 4 to 12.

These are some of the States which have taken the lead in developing testing programs for the early identification of the abilities of their youth.

Identification alone is, of course, not enough. Guidance that makes effective use of test scores, school record, and other information about the student is essential. As Dr. Conant said in a speech yesterday, "Better guidance is the keystone of the arch of public education."

The improvement of guidance will require more and better trained guidance counselors. I am glad to note that both of the bills currently under discussion make provision for increasing the number and improving the quality of training of guidance personnel. Everything possible should be done to this end.

The purpose of all this testing and guidance is to make as certain as is humanly possible that each boy and girl gets into a suitable program of study and is headed toward a congenial occupation that will be both rewarding and challenging.

The highly industrialized and advanced society in which we live requires that all our youth be brought up to as high a level of education as possible. It is particulary dependent, however, on the academically talented who will be the doctors and lawyers, the scientists and engineers, the leaders in Government and industry, the journalists, the artists, and the educators. We can ill afford to waste any of our academically talented students. The demand for highly trained men and women is very great and is increasing yearly.

In order to insure that the academically talented continue their education along appropriate lines, scholarships as well as early identification and guidance are necessary. Scholarships equalize opportunities and make it possible for the talented boys and girls to go to college regardless of their family's means. A Federal scholarship program of substantial size would provide a new incentive to students who had not considered college as within the realm of possibility.

In the study made for the National Science Foundation, which I referred to earlier, it was found that of the top 30 percent of the students, only 60 percent of the boys and 46 percent of the girls went on to college. But when these students were asked if they would go to college if they were awarded a scholarship, 83 percent of the boys and 76 percent of the girls said they certainly would go. And if we add those who said they probably would go, the proportions are increased to 96 percent of the boys and 92 percent of the girls.

It is abundantly clear that the financial factor is the crucial deterrent in preventing able students from going to college. Motivation plays a part, but with early identification and guidance, the ambition to go to college on the part of able students should become general. Without funds, however, an insurmountable barrier will remain. In fact, all three parts of the program—identification, guidance, and scholarships—are interrelated. A scholarship program is needed to give integrity to the other two parts. They would be a vast hoax without it.

And, to my mind, the Federal scholarship program should be a substantial one. One could argue for 150,000 scholarships a year on the basis that more than that number of students among the top 30 percent are not going on to higher education, and about that number would probably do so if given scholarships. Perhaps for a starter one should set one's sights somewhat lower. Certainly all of the top 10 percent should be given the opportunity to go to college. At the present, 25 percent of the boys and 40 percent of the girls in the top 10 percent do not go on to college.

A program of 40,000 scholarships per year, as provided for in your bill, Mr. Chairman, would just about take care of this group. I would regard a program of this size as a very substantial and tremendously important start, but still only a minimum program in view of the demands of our society and the competition with Russia.

You might like me to comment on the use of tests in the award of scholarships.

First, let me say that I endorse the allocation of the scholarships to the States on some equitable basis, such as the number of high-school graduates, and the selection of the recipients by a State commission in accordance with a State plan. Both bills, I believe, include such provisions.

The States, of course, should have some latitude in the bases on which they make their selections. But, in general, I would expect them to use the school record (the best index of which is rank in class), test scores, and ratings by principals and teachers. These are the time-tested bases of scholarship award used by colleges, industrial scholarship programs, and by the Government, as in the naval ROTC program. Using these indexes, appropriately combined, the selections would be well made. No method, of course, is perfect. One can never be certain that all the best individuals will be selected. There will always be some borderline cases which might have fallen on either side of the line. But

the competition would be fair to all and an outstanding group of students would be enabled to go to college.

Now, the question in your minds, no doubt, is what kind of a test or tests? And should each State have a testing program or should the tests be administered on a nationwide basis?

Although the identification testing at the eighth or ninth grade should, I believe, be State operated, it might well be desirable for scholarship selection to have a nationwide testing program that the States would have the option of using—or they could substitute a program of their own. A nationwide testing program is a ticklish business, for many people will respond that this is a way of the Federal Government's exerting control over education. This, however, depends on the nature of the tests. If they are very specific in what they cover, they would be restrictive and, in effect, might unduly influence instruction in the schools of the country. If, however, they measure the general outcomes of education that all schools are concerned with, they need not control the content of the school courses. At the same time, good examinations do provide an incentive to students, particularly when the award of scholarships is based on them.

To avoid any possible objection from the point of view of Federal control, it seems to me important to give the States the option of setting their own examinations. There is a parallel here with the certification to practice medicine, which may be done on the basis of State examinations or the national board examinations. While both systems are used, most States now accept the national boards, and, furthermore, they have exerted a good influence on the State examinations.

Although some States may well prefer to develop and administer their own scholarship tests, many States would find this difficult to do and would prefer to use national tests. As years went by, I would expect more and more States to use the national tests.

The nature of these tests should be determined by the leaders of secondary and higher education, not by the Federal Government or by any testing agency inside or outside the Government. A committee of outstanding educators should determine the specifications for the tests.

Such a committee might decide to use only a test of academic aptitude, or it might decide to use tests of the important skills developed in the principal courses of study in high school. I would only comment that if tests of the outcomes of secondary school subjects are considered desirable, it is now possible to devise tests that will not control or restrict the content of school courses that permit considerable latitude in the content of courses and the way they are taught.

There is one other matter on which I would like to make an observation. Because of the shortage of scientists and engineers, there are some who feel that a certain proportion of the scholarships should be reserved for boys and girls planning to enter these fields. This, I believe, is unnecessary. Among able students a substantial proportion choose science or engineering anyway. In both the General Motors and the national merit scholarship programs, 63 percent of the winners were planning to go into science or engineering. The implication of these figures seems clear. If we make it possible for all our ablest students to go to college, we will get enough scientists and engineers, as well as topnotch persons for all other fields. The important thing is to make sure that all our academically talented youth have every opportunity and encouragement to go to college. Beyond this, of course, is the problem of strengthening the colleges and providing the necessary staff and facilities to take care of the increased load. But these matters I will leave to others to discuss.

Appendix to Statement of Henry Chauncey

WHAT TESTS MEASURE AND PREDICT

(NEA Invitational Conference on the Academically Talented)
February 1958

There are many kinds of tests with many purposes and uses. For our discussion today, I am going to focus on the kinds of tests which have proven most practical and effective for widespread use in identification of academic talent. Such tests, whether labeled "intelligence," "aptitude," or "ability," consist usually of two chief components, generally called "verbal" or "linguistic," on the one hand, and "quantitative" or "mathematical" on the other. These two components do not measure all of the dimensions of academic talent; but what they do measure seems clearly and consistently related to academic achievement.

The verbal element is likely to involve word meaning, reading comprehension, analogy, sentence completion, etc. The quantitative element most frequently involves numerical computations and problems.

Now, what do such verbal and mathematical tests measure? Do they, dependent as they obviously are on learning and environmental influence, pretend to measure pure brightness or innate intelligence? The answer is "No." To avoid any such implication, I personally prefer to speak of testing "developed ability." For at any point when we test a student, we are dealing with him as he is—a product of certain interactions between his heredity and his environment. And, as a matter of fact, it has so far proven impossible to isolate and measure separately these hereditary and environmental influences.

However, it is the present verbal and mathematical abilities of an individual—regardless of the different influences which may have accounted for them—which offer the best prediction of his future academic achievement. Since such achievement depends on previous learnings, we must be quick to grant that different cultural backgrounds do inevitably affect test performance. However, most of the same cultural factors which influence test scores also appear to influence the academic achievement which we want to predict by means of those test scores.[1] Therefore, tests of developed ability actually gain in predictive effectiveness by tapping some basic verbal and mathematical learnings of the sort that all of our schools emphasize for all of their pupils.

Then the question may well be raised, why use a test at all? Why not depend entirely on previous school performance for prediction? In brief, because we know that test scores and school marks together predict more accurately than either one separately and each one sheds a somewhat different light. In general, we have greatest expectancy of future academic success for those pupils who rank high on both predictors; our expectancy of success is somewhat lower for those who rank high on one predictor but not on the other; and least, for those who rank low on both. Also, as these categories indicate, each predictor identifies some future high achievers who are not identified by the other.

There are some other advantages of test scores. They furnish—at any grade level—a standardized, comparable set of observations of pupils who may have been in different classes, had different teachers and come from different schools with different marking systems. They are unaffected by any disciplinary element such as may affect course grades. However, it is not necessary for us to pit one predictor against the other. For purposes of identification and prediction, both marks and test scores—as well as such other data as may be accessible and relevant—can make significant contributions.

Tests, of course, have their limitations. We have no particular evidence that they measure potential creativity, original thinking, inventiveness. They certainly will not single out for us the individual who will discover new intellectual territory, as distinct from the other individuals who will settle and cultivate that territory. In short, we cannot feed results of a secondary school standardized testing program into an electronic computer and expect a guaranteed roster of future Einsteins and Pasteurs to emerge. No matter how refined our techniques become, it is safe to say, with William James, "that individual * * * biographies will never be written in advance."

What tests can do for us, if we use them knowledgeably, is identify the larger number of students who are in the score ranges from which creative scientists, engineers, philosophers, historians, economists, psychologists, jurists, educators are most likely to emerge. Thus, if we are fishing for sizeable intellectual talent, standardized testing will not single out the species or net the catch for us. But it will tell us which pools are most likely to contain the "big ones."

The assertions I have made are based on literally hundreds of carefully conducted studies which have produced convincing evidence of a substantial relationship between test scores and such criteria of intellectual achievement as high school marks; college marks; college graduation; graduate degrees; occupational levels; etc.

The general tendencies are clear enough so that predictions can be safely and helpfully expressed in terms of probabilities or expectancies. Thus, the Commission on Human Resources was able to give us in its report[2] educational

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[1] Turnbull, William W., Influence of Cultural Background on Predictive Test Scores, Proceedings, 1949 Invitational Conference on Testing Problems, ETS., pp. 29–34. Frederiksen and Schrader, The Academic Achievement of Veteran and Nonveteran Students, Psych. Mon., 1956, 66 (15).

[2] Wolfle, Dael, America's Resources of Specialized Talent, 1954, Harper & Bros., New York City.

expectancies for 14-year-olds at various test-score levels, representing not a single "college, city, year, graduating class, or other limited sample" but "estimates for the United States as a whole in the middle of the 20th century." Thus, 14-year-olds with a test-score equivalent to 80 on the Army general classification test scale, somewhat below the national average, have about 60 chances out of 100 of entering high school and 23 chances out of 100 of graduating; about 5 chances out of 100 of entering college and 1 chance (or less) out of 100 of graduating. For 14-year-olds with a test score of 100 ("average" in respect to the total population of 14-year-olds) the expectancies are higher: 85 chances out of 100 of entering high school, 60 chances of graduating, 18 of entering college, and 8 of graduating. For a higher score (AGCT=120) the respective chances would rise to 98 out of 100 for entering high school, 90 for graduating, 37 for entering college, and 25 for graduating.

It is clear that scores from tests given at age 14 can predict, with some degree of effectiveness, educational level likely to be attained. Other studies have demonstrated that scores on tests given at age 14 correlate very highly with scores on similar tests given 4 years later.[3] Furthermore, the earlier test scores predict success in college about as well as those obtained during the senior year in high school.[4]

How effective are tests in the prediction of college success? Suppose one-fifth of the students in a certain college make an honor record and at the other extreme one-fifth are dropped for academic failure. Obviously, we would like to know in advance which students are which. Suppose, then, we give all students a typical test of scholastic aptitude before they enter college, and suppose we choose two groups of students on the basis of test scores—the 20 percent with the best scores and the 20 percent with the worst scores. How many of the students who, according to the test, are the top 20 percent will do honor work, and how many will fail? Similarly, how many in the bottom fifth on the test will fail, and how many do distinguished work?

While the results of specific studies vary, we can say with confidence what is usually found. Typically, of the students in the top 20 percent on the test, about 45 percent will do honors work, an additional 52 percent will do satisfactory work and only about 3 percent will fail. In other words, for every failing student you will have 15 honor students plus 17 adequate students. In the middle 60 percent, 17 percent will make honors, 66 percent will pass and the remaining 17 percent will fail. Now let's look at the students in the bottom 20 percent on the test. Of these only about 3 percent will do honors work, 52 percent more will pass, 45 percent will fail. For every honor student, 15 failures.

Not a perfect record, obviously; but, as actuarial forecasts go, reasonably good.

It seems, then, that the junior high school years are an especially timely period for a school to administer a standardized testing program. Prediction at this point is practical and appropriate in terms of (*a*) the psychological development of individuals, and (*b*) the organization of our educational system.

(*a*) The growth of intellectual abilities, as reflected by standardized test scores, has stabilized by this age period to the extent that an 8th-grade test is likely to be nearly as effective as a 12th-grade test in predicting, let us say, college freshman marks.[4]

(*b*) Our educational system generally requires of pupils differential curriculum choices at the end of eighth (or sometimes ninth) grade. Decisions made at this point are of vital importance for the educational and career choices of students. Decisions at this point tend to close some doors or hold them open. School administrators also must often make, around this period, particularly significant decisions about the "ability grouping" of pupils in such subjects as English and mathematics.

Although the junior high school years offer both an excellent opportunity and a pressing need to marshal efforts at identification of intellectual ability, I do not mean to imply that such efforts should be confined to those grades. On the contrary, identification should be a continuous process. The formal program

[3] Thorndike, R. L., The Prediction of Intelligence at College Entrance From Earlier Tests, J. Ed. Psy., 1947, 38 : 129–148.
Anderson, J. E., The Limitations of Infant and Pre-School Tests—the Measurement of Intelligence, J. Psy., 1939, 8 : 351–379.

[4] Doppelt, J. E., and Bennett, G. K., A Longitudinal Study of the Differential Aptitude Tests, Ed. Phy. Meas., 1951, 11 : 228–337.
Vineyard, E. E., A Longitudinal Study of the Relationship of DAT Scores With College Success, P. & G. J., February 1958, 36 : 413–416.
Samenfeld, H. W., Predicting College Achievement, J. Higher Ed., 1953, 24 : 432–438.

directed at such critical choice points as 8th and 12th grades should, ideally, build upon previous activities and lead into future ones.

In closing, I would like to refer to an investigation made several years ago of men in Who's Who and American Men of Science who took the scholastic aptitude test of the college entrance examination board at the time they were applying to go to college. Some 281 individuals who had taken this test were found and their scores were looked up. The individuals achieved prominence in a variety of fields: Government, writing, education, business, law, banking, engineering, the sciences, and a number of other vocations.

By relating the scores of these men to know score distributions of those who had taken the test, it was found that a person with a score on the scholastic aptitude test equivalent to 120–130 on the Army General Classification Test had 2½ times as great a chance of being in Who's Who or American Men of Science as a person in the score range of 110–120. A person with a score equivalent to between 130–140 had 4 times as great a chance as a person scoring between 110–120; a person with a score between 140–150 had 7 times as great a chance; a person with a score of over 150 had 14 times as great a chance.

These results seem to me to indicate that whatever is being measured is important in adult life as well as during one's schooling. They are particularly encouraging in view of the fact that the scholastic aptitude test in the early days contained only verbal questions: There was no quantitative material included.

This, then, is the general picture of testing and its effectiveness at the present time. To me the results mean that tests are by no means infallible but that they provide a highly serviceable degree of accuracy. Properly understood and properly used, tests offer a potent aid in the selection, guidance, or placement of students; and they can be used with confidence at the eight-grade level without fear of the results being ephemeral or of only passing significance.

Statement of National Society of Professional Engineers

Messrs. Chairmen and members of the subcommittees, my name is Clark A. Dunn. I am a vice president of the National Society of Professional Engineers, a nonprofit, membership organization composed of professional engineers in virtually every specialized branch of engineering practice and type of employment. All of the society's 44,000 members are registered under applicable State engineering registration laws, and are affiliated through 46 State societies and approximately 365 local community chapters.

At the present time I am director of the office of engineering research and a professor of civil engineering in the College of Engineering of the Oklahoma State University. My education record includes a B. S. in civil engineering, received from the University of Wisconsin; C. E. and M. S. in C. E. degrees from Oklahoma A. and M. College (now Oklahoma State University); and a Ph. D. in civil engineering from Cornell University. For several years I was associated with the South Dakota Highway Commission and the Arkansas Highway Department.

Inasmuch as I am appearing here today as the representative of a professional engineering society, I will direct my discussion primarily to the subject of Federal activities and their effect upon engineering and scientific education. Discussion along this channel is further justified, I feel, since many of the measures introduced during the 85th Congress have been influenced to some extent by the need for better qualified scientists and engineers. It is realized, however, that any discussion of Federal actions in this field is equally applicable to other educational pursuits.

On October 17, 1957, the National Society of Professional Engineers expressed its views regarding the engineering shortage. The substance of that statement might be summarized as saying that the accuracy of the statements published about the shortage of engineers was dependent on the definitions of the words "shortage" and "engineers," that the assumptions that the Russians were able to launch the satellite solely because of greater engineering competence was not considered valid and that further action to safeguard the Nation's future should be based on carefully considered plans in the field of education and not on an emergency or "crash" program. (The entire statement of October 17, 1957, is attached as appendix A.)

It is not my purpose in appearing before you today to discuss the merits of the apparent differences of opinion that have been expressed. One thing, however,

is certain. With future prospects of increased technology, automation, operations research, commercial atomic power, and other developments, the engineer and scientist in years to come must be an unusually competent individual. The assurance of adequate numbers of highly trained persons in these fields can be accomplished by an active public recognition of not only the need but the tremendous economic value of an efficient, stimulating educational system.

Too often we concern ourselves with the cost of education without any consideration of the many benefits which a highly educated population contributes to our national economy. If one considers the $1,400 by which the annual earnings of a college graduate exceed those of a high-school graduate, he can readily see that the mutual effort of a $6,000 or $7,000 per year teacher and approximately 20 students increases the total lifetime potential earning power of those students by hundreds of thousands of dollars. What other investment returns similar dividends? Even with the shortcomings of our present educational system, phenomenal returns make it a profitable investment.

At this point in history, what does a nation need to insure its ability to provide security for its people? Is it more men? Is it more of conventional armaments? Is it improvements in present equipment and devices? Or is it the capacity to produce breakthrough ideas—ideas which change the whole course of progress, ideas which blunt the weapons of aggression?

There is little question that this Nation can build anything it can plan and in any quantity demanded. Our need is for ideas—breakthrough ideas. Our problem is how to assure ourselves of the flow of these new weapons—ideas—for both economic and military competition.

While many valuable and noteworthy ideas have been the result of individual efforts in the past, we cannot now afford to depend on luck or chance for our security. To increase the probability of a consistent flow of breakthrough ideas, we must effectively identify, educate, and utilize our most capable people. We need, therefore, to concentrate our attention, first, on the means of identifying and, second, on the development of people who are the most probable source of these all-important break-through ideas. The long-range interests of this Nation will best be served by a program of early identification of the most intelligent students. It should be emphasized that it is logical to assume that some will also make remarkable contributions in the field of human relations.

The major obligation of the Congress, then, is to evaluate the importance of one of the Nation's resources—its intellectual giants. If this Nation's well-being and its security depend on its intellectual resources, the obligation of the Congress is to provide the leadership required to convince the Nation of this fact and also take steps to utilize this critical resource most effectively.

The greatest threat to the Nation's security may well be delaying too long the correction of public attitudes toward education.

The National Society of Professional Engineers believes that is the responsibility of the local community to provide educational programs and opportunities for persons of that area. We further believe that the Federal Government can by certain actions assist and enable the local community to discharge effectively its educational obligations. We are convinced that it is more effective for the Congress to enact legislation that will aid the community in its educational activities rather than subsidize it.

Finally, however, the ability of the local community to finance its educational program is dependent on the attitude of the public toward education. It can easily be established that there is no lack of funds that might be used for education but a lack of determination to allocate the resources of the community to this all-important function. An analysis of expenditures for various types of luxury items and entertainment will easily verify this statement.

There are more students in engineering colleges today than have been enrolled at any other time in the history of this Nation. Present enrollments justify the prediction that there will be 150,000 engineers graduated during the period 1956–60 as compared to 95,300 engineers graduated in the 4-year period ending in 1956. In addition, our expanding programs of education in technical institutes will further increase the total of engineering and supporting technical services. That these figures are indicative of the current and future situation in the overall field of higher education is evidenced by the following excerpt from the second report of the Prseident's Committee on Education Beyond the High School:

"They [colleges and universities] are called upon to provide education of a continually improving quality to a far larger number of students—at least 6 million by 1970 compared to 3 million now. The sharp rise in births which began

in the 1940's and which has already overcrowded the schools will shortly begin to strike the colleges. Meantime, with the college-age group in our population at its lowest point in 25 years, enrollments in higher education are at the highest level in history because a steadily increasing proportion of young people are going to college."

It is apparent from the above that the financing of undergraduate students by a large-scale program of Federal scholarships would put the emphasis on the need for more students, when enrollments in the United States are at an all-time high and are still growing rapidly.

Indeed, the President's Committee in specifically not recommending the development of a large-scale program of Federal scholarships stated that "it could accentuate the danger that enrollments will rise faster than the faculties and facilities needed to care for them, and it would not represent the most effective means by which such Federal assistance as may be needed could be used to aid both students and institutions * * *."

It is the considered opinion of the National Society of Professional Engineers therefore, that the primary concern of the Federal Government should be with improving the quality of students. Only after the quality is adequate should it concern itself with the quantity of our college and university students.

There are several courses of action believed feasible which the Federal Government could undertake to assist in meeting this Nation's educational needs. Suggested fields of Federal activity will be discussed in the remainder of this presentation.

ALLEVIATING THE TEACHER SHORTAGE

"Our most serious educational problem today and in the foreseeable future is a critical shortage of first-rate teachers." This is one of the significant conclusions embodied in the report of the President's Committee on Education Beyond the High School. Recognizing the serious implications of this statement, the National Society of Professional Engineers believes that either through legislative enactment or through the program activities of governmental agencies, our Federal Government should take steps to contribute to the ability of all educational organizations (primary, secondary, and college) to attract and retain superior men and women in teaching positions. In this connection it is suggested that Federal departments and agencies presently involved with education in the United States embark upon an extensive program of emphasis on the value of education and enlist the support and cooperation of industry as well as the general public in this activity.

It is a basic truism that the quality and the quantity of engineering services that are and will be available to this Nation are influenced by the nature of the primary and secondary school programs. Unfortunately, however, public apathy toward science and mathematics has created a situation in which our schools are unable to adequately instruct junior and senior high school students in the basic fundamental sciences and in mathematics. Recent information indicates that 60 percent of the 72,800 freshmen engineers in engineering colleges of this country in 1955 were required to take noncredit or preparatory mathematics before they could enroll in regular college courses. Because an additional semester in college is usually required to make up the work missed in high school, it has been estimated that this lack of adequate preparation cost these students and their parents $26 million that year.

Providing instruction to correct these deficiencies is not a simple matter. In primary and secondary schools where it is the policy to determine salary rates for teachers without regard to fields of specialization, it generally means that students are denied the opportunity to study mathematics and science or are forced to accept instruction in the subjects from teachers of comparatively less competence than in other subjects.

The law of supply and demand creates this situation, for teachers of science and mathematics have opportunities for employment by industry and the Federal Government. These teachers are often able to obtain higher salaries than they can in the teaching field. Thus, the less competent ones tend to remain in the teaching field. For that reason, students in mathematics and science are forced to accept less competent teachers as long as the salary for science and mathematics teachers remains the same as that for teachers in all other fields.

It should be the practice of school officials to adopt salary policies that provide students not only the opportunity to study mathematics and science, but also instruction in these subjects that is on a par with other instruction. Where

schools follow a salary policy based primarily upon years of tenure and years of college training, they force students to accept less competent instruction in some fields than in others.

It should be emphasized that the need for science and mathematics in the high schools is not alone for the preparation of people who will enter a college educational program where such training is essential to their progress. It is important that many other people who function in the present economy understand science and mathematics in order to be most successful and productive. In other words, science and mathematics are part of present day culture and anyone who is not acquainted with this aspect of our civilization is not well grounded in the fundamentals essential to his cultural growth and his economic well-being.

In addition to the importance of the teacher in our junior and senior high schools to assure adequate technical preparation of students for post-high-school education, the teacher's role in stimulating the ambitions of the student is possibly of equal or greater importance. A factor adding to the importance of this function is the attitude of parents who desire that their children have an easier life than they have had themselves. Consequently, the school system is the place where many young people develop that spark of ambition which will carry them toward a college degree and possible professional status.

Students who are capable of following engineering careers can be stimulated, encouraged, and challenged by teachers who are interested in and educated in science and mathematics. It is important that employment conditions in the schools attract such teachers if an adequate supply of capable, well-trained engineers and scientists is to be available in the United States. We must attract and retain the caliber of teachers who prepare the students technically and stimulate their interest in further education.

Any method of approach toward the procurement and retention of qualified teachers must take into consideration what we believe to be a fundamental maxim—that the local community must assume the responsibility for the support of its own schools and educational programs. The National Society of Professional Engineers believes that it is more effective for the Congress to enact legislation that will enable a community to discharge its educational responsibility rather than to enact legislation that will subsidize educational activities in that community.

As indicated in Tomorrow's Scientists and Engineers, a publication of the National Association of Manufacturers, a recently conducted survey of the professions shows that the average income of a dentist is 2½ times that of a teacher, the lawyer 2⁷⁄₁₀ times and the physician 4²⁄₁₀ times. These low salary rates for teachers not only discourage many able, interested young people from entering the teaching profession but probably influence some of the more able high school students to terminate their education with high-school graduation.

The national society firmly believes that funds to increase the salaries of teachers so that our young people will have the best instruction should be aggressively sought by everyone. This procedure is insurance not only of security but also of economic well-being.

Accordingly, the National Society of Professional Engineers recommends the following as examples of possible Federal actions affecting engineering education:

1. Support of the National Science Foundation in its effort to establish more fellowships for high-school teachers of science and mathematics to continue the education.

2. Establishment by legislative action of a program, in line with what industry is presently doing, providing authority and funds to Government agencies for the temporary summer employment of teachers in positions that would improve their teaching ability and income.

3. Changes in the Internal Revenue Code to provide that a teacher may deduct from gross income certain amounts paid by him for his further education and training.

4. More liberal tax treatment on contributions from individuals and industries to educational institutions and programs.

5. Support of tax legislation that would permit deductions for families supporting students in college.

6. Support of programs for the dissemination of information to the public about Federal or private scholarships, fellowships and loan funds that are now available to students.

While the National Society of Professional Engineers believes that additional funds are necessary to provide the quality of education that is in the Nation's best interest, we fully recognize that money alone will not improve our educational program. Making teaching positions worthwhile to capable people both from the standpoint of prestige and professional recognition is also essential.

EXPANSION OF PHYSICAL FACILITIES

It has been estimated that physical facilities account for only 10 to 15 percent of the total cost of education in this country. Nevertheless, modern up-to-date facilities and equipment are essential teaching tools in our engineering colleges and universities. The Atomic Energy Commission is to be commended for its program of assistance to educational institutions in acquiring nuclear reactors and other related equipment and facilities for teaching in the nuclear-engineering field. A recent program of the National Science Foundation to assist in providing specialized facilities should be given the support of Congress.

The national society believes that some methods might be devised to encourage increased contributions of money and equipment from our larger industrial corporations. H. R. 4525, introduced by Representative Henry S. Reuss, is an example of possible Federal action along this line in that it provides for additional deductions of charitable contributions by corporations to or for the use of an accredited school of engineering. The Reuss bill is, in our opinion, a recommendation of a feasible manner by which the Federal Government could significantly promote nationwide assistance of engineering education.

ENCOURAGING TECHNICAL INSTITUTE EDUCATIONAL PROGRAMS

It is generally recognized today that the efficient utilization of our country's engineers can be improved by the expanded use of trained engineering technicians to relieve the engineer from many of his routine, repetitive tasks. By the judicious use of technician personnel such as engineering aides or assistants, the engineer can consequently be given the opportunity to devote more of his time, effort, and abilities toward those activities which are nearer the highest level of his competence. Since present and future factors indicate highly qualified engineering talent to be at a premium, the role played by the engineering technician in our economy will become increasingly important.

To meet this recognized need for trained technicians, many technical institutes and industrial firms offer courses and technician training programs. Interested youngsters can qualify as skilled technicians in half the time it takes to train the engineer. These technician training programs usually take approximately 2 years and include instruction in mathematics and the basic physical sciences at the post-high-school level. Because the productivity of our engineering manpower can be greatly enhanced by the supplemental use of technician assistance, the National Society of Professional Engineers believes that the Federal Government should encourage technical educational programs and support Federal agencies in their efforts to acquire and utilize technicians to supplement the work of engineers.

Departments of the Federal Government which require personnel with technical training should also give careful consideration to long-term contracts for technician training with educational organizations that can provide this service. Federal agencies might even underwrite technician programs essential to their operations at institutes where trainees would receive training. In addition, the wartime program known as Engineering, Science, and Management War Training Courses should be reviewed carefully since considerable experience was gained from its operation. The ESMWT was a plan by which approved educational institutions were authorized to conduct certain intensive courses quite similar to those now offered in the 2-year technical institutes.

ASSIST SCIENCE AND ENGINEERING STUDENTS IN THE PURSUIT OF GRADUATE WORK

With 1 year of graduate study, the engineer increases his technical competence by approximately 50 percent. This rather startling statement is based upon the fact that only about one-half of the standard 4-year undergraduate program consists of engineering subjects. It is a significant indication of the extent by which the total competence of our engineering manpower can be increased by graduate study. In addition, with opportunities for graduate study more readily available, those who enter the field of engineering education can be

better trained, resulting in consequent improvement in the quality of our collegiate education.

According to figures published by the National Science Foundation, for example, doctoral degrees in science and engineering have held relatively steady at approximately 50 percent of all doctoral degrees granted for several decades. In the past 3 or 4 years, the percentage has been slightly higher—around 55 percent. It is imperative to our national welfare that this trend not only maintains its present position, but that it increases in the future.

Since only about 20 percent of our engineering graduates annually enroll in graduate school, it is the considered opinion of the National Society of Professional Engineers that a greater percentage of our most capable engineering students of proved ability be encouraged and enabled to extend their education beyond the attainment of a bachelor's degree. The aids given students by the National Science Foundation Fellowship program, as well as the fellowship plans supported by other agencies of the Federal Government and many industrial organizations, are steps in the right direction. But these programs must be expanded in both number and coverage.

It is true that research for governmental agencies at educational institutions is increasing the number of graduate students in science and engineering because it offers them opportunities to earn a portion of their expenses. A word of caution, however, by the President's Committee on Education Beyond the High School is appropriate here: "Similarly, those including the Federal Government who purchase services, under research contracts and the like, should pay the full costs of these services. To take a subsidy, even indirectly, from financially hard-pressed colleges and universities is hardly a sensible public policy." We are fully in accord with this statement.

Furthermore, we urge expanded Federal support of the National Science Foundation in its program of sponsoring basic research at educational institutions. Such a program might well be instrumental in providing for an expansion of physical facilities and in the encouragement of increased graduate study.

To summarize the position of the National Society of Professional Engineers on this most important subject of Federal aid to engineering education, we believe that the Federal Government should undertake either by legislation or the implementation of existing programs of governmental agencies the following courses of action:

1. Improving the ability of all educational organizations (primary, secondary, and college) to attract and hold superior men and women in scientific and engineering education positions.
2. Assisting in programs that encourage the improvement and expansion of existing physical facilities which are essential for a well-rounded engineering education curriculum.
3. Encouraging technical institute educational programs where the courses are at the post-high-school level.
4. Assisting science and engineering students of proved ability who have completed their bachelor's degree program to pursue graduate work.

Although mathematics and science are the core areas in the education of engineers, engineers require a broad education so that they can transmit information to other groups.

The National Society of Professional Engineers sincerely appreciates the opportunity of appearing before you today. We hope that we have developed some points which deserve consideration, and we hope that we have made some suggestions which are worthy of your further study. The national society deeply desires to cooperate in every possible way to aid the committee in the important task it has assumed and has tried to help develop some answers to a problem which is paramount in our national life.

THE ENGINEERING SHORTAGE

Statement by the National Society of Professional Engineers, October 17, 1957

Within recent weeks, related developments have provided fresh evidence for those who contend that there is a severe shortage of engineering and scientific personnel and, at the same time, for those who maintain that there is not a

shortage. This contradictory situation has existed since 1949 when one of the largest engineering graduating classes in history led to predictions of an oversupply—followed a year later by the Korean war, the increase in defense spending, and the subsequent high demand for engineering and scientific personnel.

Since then, many leaders in public life and industry have expressed a fear that the output of trained engineering talent has been lacking in numbers to the extent that the Nation's security is in jeopardy, and have called for various forms of "crash" programs to produce more engineers. Others have contended during this period that the shortage was synthetic, or highly exaggerated.

Recently, defense budget cuts caused the layoff of a number of aircraft employees, including some 1,000 engineers. This resulted in extensive publicity to the effect that the shortage was over and that more engineers would be laid off as further cuts were made in defense spending. Now, the launching of the Russian earth satellite has resulted in even more extensive statements and publicity that the United States is trailing Russia in scientific achievement because we have not produced enough engineers and scientists compared to the U. S. S. R. New demands are being voiced for "crash" programs to train larger numbers of engineers and scientists. Some leading members of Congress have stated that they will move for extensive Federal scholarship programs when the legislators resume their work next January. In the face of this on-again off-again situation, the engineering and scientific professions and the general public are understandably confused and uncertain.

The validity of each point of view regarding the supply of engineers depends on interpretation and analysis of data which has been published in great detail and variety. Despite this wealth of information, however, both points of view probably can be defended if the definitions of two terms—"engineer" and "shortage"—are made by the respective groups.

The National Society of Professional Engineers has observed and studied the various statements, reports, and analyses during this period. We recognize an obligation to the Nation's economy, the engineering profession and to the young people who may be considering the choice of an engineering career, to lend assistance in the clarification of these conflicting viewpoints, and to the extent possible to assist in the selection of the best alternatives in the future.

It is most important that the Nation not rush into hastily improvised actions having to do with the education of engineers which would only aggravate a complicated and difficult condition that cannot be solved by spur-of-the-moment solutions.

Based on close observation of the engineering profession's growth and intimate experience in professional engineering activities, NSPE believes that the following factors are sound observations for future guidance:

(1) Special action to increase today's supply of engineers is not considered necessary or desirable since engineering enrollments are at an alltime high and are continuing to increase.

(2) An artificial stimulation to further increase enrollments in engineering will severely handicap institutions that devote adequate attention to the capable students.

(3) Assumption that Russia launched the earth satellite before the United States solely because it had trained more scientific personnel in recent years than this country, we believe is not valid and could lead to unwise and damaging decisions. We believe it would be more logical to assume that the controlling factors were priorities assigned to money and emphasis, rather than a shortage of technical personnel in the United States.

(4) Emphasis now more than ever should be placed on quality rather than quantity. Potential engineers should be better grounded in fundamentals when they enter the engineering educational program and should be better informed as to the qualifications essential for an individual to become a successful engineer.

(5) In view of the present limitations of facilities and faculties, the substantially increased enrollments in our engineering institutions are causing serious difficulties at the present time. Any program which will substantially add to the present number of students must include means to resolve these limiting factors.

(6) It should be emphasized that projects such as the earth satellite, guided missiles, etc., depend on highly advanced technology—a mere increase in numbers of those with first degrees will not provide the type of highly advanced technical knowledge which is necessary. It should also be noted that any program based on present needs will not succeed in solving today's technological problems. A

program starting today will not produce a single highly qualified engineer or scientist for at least 6 years.

(7) Experience has shown that we have wasted engineering talent by using it at a level below that which it is capable of performing. Improved utilization of engineering talent can do more for an immediate need than any other single program.

(Whereupon, the subcommittees recessed to reconvene at 10 a. m., Monday, March 3, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

MONDAY, MARCH 3, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION
AND SUBCOMMITTEE ON GENERAL EDUCATION,
COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10:20 a. m., in room 429, Old House Office Building, Hon. Carl Elliott presiding.

Present (Subcommittee on Special Education): Representatives Elliott (chairman), Green, McGovern, and Wainwright; (Subcommittee on General Education): Representatives Gwinn and Haskell.

Also present: Representative Holt.

Staff members present: Charles M. Ryan, general counsel; Kennedy W. Ward, assistant general counsel; Mary P. Allen, clerk (Subcommittee on Special Education); Robert McCord, clerk (Subcommittee on General Education), and Russell C. Derrickson, chief investigator.

Mr. ELLIOTT. The Subcommittee on Special Education, meeting jointly with the subcommittee on General Education, will be in order.

Our first witness today is the gentleman from Missouri, Mr. Curtis. Mr. Curtis came to Congress in 1950 and is a member of the House Committee on Ways and Means. He has introduced legislation to give tax relief to schoolteachers. He has no bill pending before this subcommittee, but he has requested an opportunity to be heard on educational matters and has shown himself to be interested in the matter of the legislation now before this committee.

I want to say that we are happy to have the gentleman from Missouri with us. We look forward to what he has to say and we welcome everybody else who cares to visit our committee at any time. We are always anxious to hear witnesses who want to give testimony on the matters before us.

I believe the gentleman from Missouri has copies of his statement which the clerk will give to the members. You may proceed in any manner in which you care to proceed, Mr. Curtis.

STATEMENT OF HON. THOMAS B. CURTIS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MISSOURI

Mr. CURTIS. Thank you, Mr. Chairman. I appreciate very much this opportunity to appear before the committee. I do have a prepared statement. In going through it, I may skip some of it for the sake of time. If I do, though, I would request permission that the full statement be included in the record, if I may.

I believe that this committee has under consideration one of the most important matters facing our society today. You can help our educational system by what you do, but you can also badly damage our educational system by what you do.

Your committee has before it the President's message of January 27, 1958, urging that the Federal Government take a much greater role in the field of education than ever before. You have many specified bills referred to your committee which undertake to accomplish this end in a variety of ways, some conflicting and some compatible with each other. The costs of these various proposals run from a few millions of dollars to many billions of dollars.

I have a real concern for the problems of education. I am a product of the public school system. My five children are attending public schools at the present time. I am a former teacher in night law school and was a member of the Missouri State Board of Law Examiners for several years. I am a member of the board of trustees of Dartmouth College, a member of the board of overseers of the Thayer School of Engineering and the Tuck School of Business Administration at Dartmouth.

I was a naval officer during World War II, where I was in close contact with the technical skills required in the maintenance and operation of aircraft. I have followed as closely as I could the problems in all phases of our education today. I have introduced certain bills which are now pending before my own Committee on Ways and Means to alleviate some of the problems confronting us in education today, which are as follows, to wit:

1. H. R. 10804 permits school teachers and administrators to deduct from gross income certain expenses for additional education or training.

2. H. R. 10904 allows a 30-percent credit against the individual income tax for parents and others for amounts paid as tuition or fees to certain public and private institutions of higher education.

3. H. R. 10835 permits a tax credit for contribution and other expenditures for basic research in science.

There are many provisions in the present tax laws which I sponsored and supported in the past to remove impediments to the growth and stability of our educational system.

I would like to make the following points for the committee's consideration:

1. Our educational system with all its errors is essentially sound and vastly superior to Russia's. We must be careful that we do not imitate Aesop's dog. In carrying its bone, it mistook its own reflection in the water for a dog with a bigger bone, and in its desire to gain the bigger bone lost its own in the ensuing splash.

2. The best way for us to move ahead is to concentrate on our own educational system to correct the errors that exist and to strengthen the areas that need attention. We must maintain an attitude of self-criticism. Objective and intelligent self-criticism is a stronger and more permanent incentive than fear. It produces healthier and more permanent results.

3. There is a great danger in resorting to the fear of Russia as a stimulus to improve our educational system. It requires public emphasis on Russia's strong points and public emphasis on our weak

points. We are competing with Russia for the minds of people in all the nations of the world. Building up Russia as a paragon of achievement causes us great danger in this crucial competition. The logical conclusion is that if the system of communism can produce such great results in the important field of education, it must not be the bad system that it has been portrayed. Now, if Russia has produced this result, then how to handle it is one thing; if it has not, that is another.

I am satisfied any objective study of the recent emphasis Russia has placed upon education will reveal that she is still considerably behind the United States in achievement. Such an objective study has been made. I am sure the committee is familiar with the book Soviet Professional Manpower, Its Education, Training and Supply, by Nicholas DeWitt, Russian Research Center, Harvard University. This book was published by the National Science Foundation in the fall of 1955. I happened to bring it along.

I think if anyone reads this book, he will get a pretty good balance of the institution.

Furthermore, as Russia improves and broadens her educational system, she sows the seeds and nourishes the growth that will help to destroy the godless totalitarian system of government. This system of government is our real enemy and not the Russian people.

4. Before Congress undertakes to extend the Federal Government's authority in the field of education, it is essential that it thoroughly appraise the Federal Government's present role in this important area to determine whether its role is proper and conducive to the growth and stability of the education system. Regrettably, this appraisal has not been made to any great extent to date. I am hopeful that this subcommittee will undertake it before it takes any further basic action.

I am convinced that the greatest damage that is occurring in our educational system today stems from the role of the Federal Government during the past 8 years.

A. Under the guise of a peacetime draft law, the Military Establishment has effectively disrupted for the past 8 years the education and training of every youth in America. Even those who have not been drafted have had their plans disrupted by uncertainty. Those who have been drafted include potential teachers, engineers, scientists, and indeed any potential professional man or technician who have had 2 to 3 years taken out of the most crucial periods of their education. Their time has been devoted to largely sitting on their hands in a military uniform.

If the military utilizes the peacetime draft system for its intended purpose; that is, acquiring the personnel needed to carry out its functions, it would be an entirely different matter. Unfortunately, the peacetime draft law is being used to carry out the specious, impractical and rejected philosophy that "every American boy should have military training." I say rejected philosophy because the Congress rejected the Military Establishment's request for universal military training. It was rejected, in part, because the military could never define by curriculum or even in general terms what constituted military training.

During the debates on the various bills, members of this Committee on Education and Labor raised the point that if the bill really was to be a training bill, it should be referred to the Committee on Education rather than to the Committee on Armed Services. Mem-

bers of your committee warned, and I joined in that warning, that UMT would badly damage our educational system. I charge that the peacetime draft has been perverted in its use to a universal training program, and indeed, it has badly damaged our educational system and is continuing to do so.

The first step that I would suggest that this committee takes is to examine into this charge to see if it is substantiated. If it is, then it should recommend to the Congress what steps must be taken to require the military establishment to carry out the intention of the peacetime draft law and not subvert it. Such positive action should bring positive results, to wit:

1. We would improve our educational system, particularly in the area of scientists and technicians.

2. We would improve our defense strength because we would be getting our men trained in military science back to the jobs they are trained for and away from education for which they are not trained.

3. We would save billions of dollars that are presently being wasted on inadequate training and usage of personnel.

B. In the 1920's and 1930's the American Legion sponsored a universal military training bill that was based upon an expansion of the high school ROTC program. It had proved quite effective in training men for wars like World War I and to some degree World War II. The basis of this plan was the proper utilization of the educational facilities already existing in the society, rather than an attempted duplication of these facilities in the military.

The need in modern warfare for technical skills, as opposed to short-order military drill skills, indicates that we should be utilizing the educational facilities that exist in the society in the field of vocational education, instead of having the military establishment duplicate them at the cost of billions of dollars.

We achieve at least three things by following a program based upon utilization of the educational plant already in existence, to wit:

1. We get better-trained technicians.

2. We get these technicians at one-tenth the cost.

3. We work with, rather than foul up, the civilian educational system.

Fortunately, this is not a matter of theory. It is a matter that was proved conclusively in World War II by the Seabee personnel procurement system.

To illustrate, the Seabees needed bulldozer operators. They did not take 18-year-old boys with a couple of weeks' boot training camp experience and send them for a few months to a bulldozer-operating school set up by the Navy. Instead, they offered enlistment opportunity with a suitable rating to experienced bulldozer operators in the civilian society and accepted them even though they were "fat and 40," if they really knew how to operate a bulldozer. The accomplishment of the Seabees in World War II is fabulous and resulted essentially from this personnel system.

The Seabee formula was abandoned when the war was over. The Navy now operates a bulldozer-operators school and takes young men, whether they want to be bulldozer operators or not, and sends them to this school for a few months. The results are obvious:

1. You do not have a very good bulldozer operator.
2. After the enlistment period is up, the man involved may or may not take a civilian job operating a bulldozer, likely not, so the skill is lost. Incidentally, the Reserve program has not been carried out to successfully retain these skills.
3. The cost to the Navy of running the school is considerable.
4. The talents of the naval personnel who run the school are taken away from the fields where they could be efficiently utilized.

My second suggestion to the committee, then, is that they study the operation of the vocational educational training programs of the Military Establishment. This study would disclose how much duplication of bricks and mortar, costly equipment, teaching personnel and student manpower exists. Certainly this must be evaluated before we follow the suggestions of the administration that we cut back on the indirect entry of the Federal Government into the field of vocational education by cutting out the subsidies granted the States in their vocational educational programs.

And I might state that I have appeared each year before the Appropriations Committee to urge this very point, that we do not cut back on our moneys going to the vocational educational system until we have reviewed the area of duplication by the military service.

C. This committee, in my judgment, should review from an edurivalry in these programs has been carried to the point that there are and university campuses of America.

One thing I suggest that will be found at once is that interservice rivalry in these programs has been carried to the point that there : re triplicate programs in teaching basic fundamentals going on, wasting teaching personnel, equipment, classroom space, et cetera.

Furthermore, this Committee on Education should study the substantive aspects of the ROTC educational program.

Finally, the committee should examine fiscal aspects of the ROTC programs. I think you will find that the Federal Government has not been bearing its fair share of the cost to our colleges and universities for these programs. Certainly Federal appropriations to bear the fair share of this cost are in order, and there is an area in which the subcommittee could immediately recommend some funds being spent.

D. This committee should look into the programs of sending our men trained in military science to graduate law schools, business schools, et cetera, to acquire proficiencies which already exist in sufficient quantity in the civilian society. This is a duplication of costs, a misuse of talents acquired in military science, and a failure to utilize the superior skills which are available.

E. I believe this committee should review the educational programs in the service academies. This is of particular significance today, in that we are calling upon our professional military leaders for so many things which are only indirectly connected with military science. An excellent comprehensive study of the education of our military leaders has recently been made by Profs. John W. Masland and Laurence I. Radway. Their findings are contained in their book, Soldiers and Scholars, Military Education and National Policy, which was just recently published.

5. I recommend that this committee make a thorough study in the area of scholarship loans.

The Fiscal Subcommittee of the Joint Economic Committee, of which I am a member, recently conducted a study of the economic effects of our expenditure programs. The areas of education and research and development were subjects of several papers by experts in these fields. One paper contains a table, and I will supply the direct reference for the record, showing the increased earning capacity based upon the amount of education received. There is a direct correlation between the two. This suggests the obvious conclusion that it is worth dollars and cents to the individual to invest time and money in his education. It suggests that on an actual basis we have an area for postpayment plans which are fiscally sound.

After this matter was called to my attention, I contacted several business executives in the consumer credit field and asked them whether or not it was possible to set up a sound postpayment plan for education on the basis of these statistics. I suggested that if postpayment plans for Florida vacations were now routine, surely postpayment plans for education should be feasible.

I found that the CIT Corp. had a postpayment plan for education. It is quite limited in time limits for repayment and it is further restricted to the parents or guardians of the student and does not permit the student himself to set it up. I suggest, however, this is a step in the right direction and should be helpful to this committee as a starting point.

At this point, I want to call attention to the fact that today none of the top students in this country are failing to go to college for lack of scholarship funds. The scholarship funds available fully cover our top students. But we are not taking full advantage of the talents that exist in our society.

By way of illustration, at Dartmouth College 30 percent of the student body are on scholarships and all scholarship funds are granted on the basis of need. In a freshman class of 750, the top 200 needy boys will get scholarships on the basis of their academic abilities. However, there will be another 200 not as good in scholarship as the top 200, but better than the last 200 going to make up the class of 750, who will not get scholarships because of lack of scholarship funds. It is the talents of these above-average, but not the very top, boys whose talents are not being developed to the fullest.

I believe a loan program is best suited to help these boys. It seems to me that this committee, if it is not already planning to do so, should make a study of the economic feasibility of a student-loan program, and if it is necessary for the Federal Government to stand behind the program to demonstrate its fiscal soundness and to get it going, this should be done. For many reasons, especially educational reasons, this would be vastly superior to any direct Federal scholarship program.

6. An area where Federal funds of a limited amount could presently be spent effectively, and I believe without any complications, is in the area of teaching fellowship grants. Here we have the already proven future scientist or professional expert whom we should encourage to continue his education. Yet, because of his superority, he is in demand from the business world. He is at an age when

marriage is usual and appropriate. We do not have enough funds to enable enough of these talented young people to pursue a normal existence and continue their studies.

I was glad to see in the supplemental appropriations bill additional funds for teaching fellowships, and I hope that that program will be strengthened.

7. Finally, I want to call attention to H. R. 10456 and H. R. 10464, introduced by Congressman Price and Congressman Van Zandt, and the statements they made on the floor of the House in support of their proposals, page 1359, Congressional Record, February 3, 1958. I believe the kind of scholarship which they propose, which are planned to start a chain reaction, have much to be said for them. I support these bills.

I want to thank this committee for giving me this time.

I conclude as I started by stating that you have before you one of the most important matters that face our society today. Federal funds can help, but they can also badly damage our basically sound educational system. It requires knowledge and wisdom to choose the proper programs. Only hard work will produce the necessary knowledge. The wisdom can only come from exposing the problems to our society.

Time has shown that the best wisdom in any society is the collective wisdom, not that of any small group or segment, and your committee, by holding these hearings, is performing the necessary public service.

Thank you.

Mr. ELLIOTT. Thank you very much, Congressman Curtis.

Mr. McGovern.

Mr. MCGOVERN. I have just one question, Mr. Curtis.

You made some rather serious charges about the peacetime draft as it relates to our total educational program.

Mr. CURTIS. Yes, sir.

Mr. MCGOVERN. Do you think that the time may have come for us to consider the possibility of ending the peacetime draft?

Mr. CURTIS. Yes, I think the thing should be appraised on the basis of the need of the Military Establishment for personnel. I am satisfied a real examination into the way the peacetime draft has been functioning will cause you to find that the objective is not getting the personnel needed, but, rather, it is deliberately set on a turnover basis so that they are trying to get in as many people as they can to have 2 or 3 years' military experience, as they call it, so that they will go back into society following out the theory of UMT.

That is not, as I understand it, the purpose of the peacetime draft. The peacetime draft is to give the needed personnel to the military.

Those are two entirely different objectives, and it is the fact that they have been following the other objective that has produced the damage that I suggest does exist to our educational system.

Mr. MCGOVERN. I was wondering if some of these things may have been in the mind of Mr. Stevenson during the 1956 campaign when he offered a suggestion that we might reexamine the peacetime draft.

Mr. CURTIS. They could easily have been, and it was not, in my judgment, the proper time to propose a thing that was this complicated and required objective study be because, as I have presented to the

committee, I have reached these conclusions from the limited study I have made, but I recognize that these are very serious and far-reaching things, and my opinions or conclusions may be wrong; but I do believe that there are enough people like myself who have tried to study this who have come to this conclusion and that that warrants this subcommittee or somebody making an objective study into this to see if those charges are not well-founded. I think they are.

Everyone here knows there is not a young man anywhere in the United States who has not had his program as to what he is going to do, what career he is going to follow, whether he is going to college or what he is going to do, disrupted by the manner in which the peacetime draft law has been administered.

Mr. McGovern. I thank the gentleman.

I think you have raised some very important questions that deserve very careful scrutiny.

Mr. Curtis. Thank you very much.

Mr. Elliott. The gentleman from New York, Mr. Gwinn.

Mr. Gwinn. It seems to me, Mr. Curtis, that you are just the man to father a bill and get it going so as to give us the responsibility. We have no bills now pending that would enable us to go into most of the subject matter you have covered.

I certainly agree with you that we are duplicating a lot of work, failing to utilize the normal machinery of education, setting up artificial situations, all along the line. It ought to be gone into.

Now, how do we do it? That is the question.

Mr. Curtis. Well, one technique, of course, is to introduce a bill, I will be honest with you. As we all do on our committees, you are primarily directing your attention to your work, so, as you will notice with the bills that I have introduced in Ways and Means. I can help the educational program as I see it on bills there.

To draft a specific bill on this subject, I am not sure is timely. I am a great believer in holding hearings first to get information, although you can put in a bill to do that.

For example, when I was made chairman of the subcommittee to figure out how to tax life insurance companies, I did not introduce a bill. I had our committee hold public hearings on the general subject to get the material out, and then we introduced a bill and then held further hearings on the specific bill.

I think in this area it is serious enough. There has not been, as nearly as I can find out, any real definitive study made, and therefore, what I am really suggesting is a staff study, which is one technique; then, on the basis of the staff study and a report of the staff, hold public hearings on what the staff has found. That is a technique we have found very valuable in the Joint Economic Committee, of having the staff review the area, pick out the problems and the things that are at issue, publish that and then hold hearings on the staff report.

Mr. Gwinn. Do you know whether there are many Members besides yourself informed on this subject, or who have convictions about it?

Mr. Curtis. Yes, there are a number, and I would say that most of the younger Members of Congress who had lengthy service in World War II have reached conclusions somewhat along these lines. I can suggest Congressman Brownson of Indianapolis, who was 5 years in the Army, and has continued his interest in the Reserve pro-

gram, as one. I know there are many, and I could certainly supply a list of those names.

Mr. GWINN. I think that would be important.

Mr. CURTIS. Incidentally, I would like to call the committee's attention to the fact that I was talking with the Secretary of Health, Education, and Welfare, Secretary Folsom. In fact, I had lunch with him and his top executives. I do not think it is out of order to mention the point we discussed.

I raised this whole question of vocational education. I said, "What study has been made down in the Department of Health, Education, and Welfare on the subject of the vocational training that the military have moved into," and the Secretary told me that they had made no study because they had no jurisdiction.

I pointed out that just because you put a uniform on, it does not mean that you have altered necessarily what is going on; that if you go, as I have gone, through many of the vocational educational classrooms run by the military, you will find that they are identical with the vocational education classrooms in our civilian society, with one difference: That the military has much more plush classrooms and better equipment, but it is the same program. The military is competing for the teaching personnel with our civilian educational system, which further indicates that this is a duplication.

Mr. GWINN. Thank you.

Mr. ELLIOTT. The gentleman from New York, Mr. Wainwright.

Mr. WAINWRIGHT. I would say Mr. Curtis represents George Santayana's character, The Last Puritan in Congress of the intellectual conservative, and I certainly enjoyed his statement.

Mr. CURTIS. Thank you very much.

Mr. ELLIOTT. The gentleman from Delaware, Mr. Haskell.

Mr. HASKELL. I would like to associate myself with the remarks of the gentleman from New York.

Mr. CURTIS. Thank you very much.

Mr. ELLIOTT. This subcommittee appreciates your kindness and help very much, Mr. Curtis. You have brought us matters that have stimulated our thinking in this field, and I want to say that I have been particularly interested in what you had to say about the loan portion of this program.

We thank you very much.

Mr. CURTIS. Thank you, sir.

(Supplemental information furnished by the witness follows:)

From the economic point of view, education is an important kind of capital investment. The investment takes the form of human characteristics instead of bricks, mortar, and machinery. The effect on production, however, is the same. For this reason the education our people have received may properly be regarded as one of our greatest national assets. And the process of educating the young may be regarded as our most potent form of capital investment.

TABLE 1.—*Median income in 1949, for males 14 years old and over, by years of school completed*

Years of school completed:	*Median income*	Years of school completed—Con.	*Median income*
0	$1,108	9 to 11	$2,917
1 to 4	1,365	12	3,285
5 to 7	2,035	13 to 15	3,522
8	2,533	16 or more	4,407

NOTE.—Data for table 1 and related text discussion are from the Statistical Abstract for 1957, tables 130 and 258, and from the U. S. Department of Commerce, Historical Statistics, series D77–89.

The mere abilities to read, write, and calculate are of great importance for those who are to enter industrial employment or to conduct modern agriculture. To be able to read signs, or to comprehend written instructions, or to carry out simple calculations are obvious requisites to almost any kind of skill. A rudimentary knowledge of science has innumerable applications in everyday life. Training in manual arts, household management, agriculture, and other skills have of course a direct bearing on productivity.

Mr. ELLIOTT. Our next witness is Dr. Edward Teller. Dr. Teller, as is generally known, is a physicist at the Radiation Laboratory at the University of California at Berkeley. He is noted throughout the world for his attainments in science and, above all, of course, for the role which he played in the development of the hydrogen bomb.

Dr. Teller, this committee is complimented by your coming, and we are looking forward with great interest to what you may say to us. You can say it in any manner that you care to use. If you have a statement, you may read it. If you want to summarize, you may. Proceed in the manner, however, you deem best.

STATEMENT OF EDWARD TELLER, PHYSICIST, RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA AT BERKELEY

Dr. TELLER. Mr. Chairman, thank you for your very kind words.

Gentlemen, I am sorry I do not have a written statement. I have a few remarks which I would like to make.

I would like to start by saying that you are asking me to testify on a matter in which I am not an expert. I would like to say quite a few things, because I have been worried about trends which look to me quite dangerous. I have a little experience, but no expertness.

I had the honor to testify a few weeks ago before Senator Hill's committee, and at that time I talked mostly, I believe almost exclusively, about education in our elementary schools and high schools. I did so because I believe that our greatest difficulties, our greatest shortcomings, are in the elementary and high schools, and that we have to try to apply corrective measures there more than anywhere else.

I know that you are considering a number of extremely important bills which I have studied to some extent, but I must confess that, not being an expert either in education or in legislative matters, I am afraid that any attempt on my part to offer quite specific comments would probably not be valuable. I would, therefore, like to talk more about generalities, with your permission. I should like to repeat quite briefly some of the things about elementary and high-school education and then come to talk about higher education, which I think is at present more in the focus of your attention.

Mr. ELLIOTT. Yes, sir.

Mr. TELLER. Now, to my mind, there is a very great danger in the competition which Russia is offering to us. I think it would be extremely foolish to minimize this danger. It would be foolish because education is a long-drawn-out process. If we make mistakes, and if, as a consequence of these mistakes, we see the Russians forging ahead, and if we have neglected the education of our young people, then our deficiencies will not be corrected for a decade or two.

There are already today danger signs, and very grave danger signs. Russian technical efforts, particularly in the field of applied sciences,

which has been not at all serious in 1945, are now at a level where they can be matched by no one except by ourselves; and if that trend continues, there is no doubt about it that 10 years from now we shall be left behind.

The time which is needed in planning, constructing, and mass-producing an airplane is quite long. But the lead time in producing really competent people is longer still and, with our having seen what we have seen, I think we cannot be slow in applying most determined corrective measures.

Now, I would certainly not like to sing the praises of the Russian educational system, certainly not in every respect. They are achieving their results by the onerous methods of competition and the crueler methods of coercion. They are driving on their population and they are driving on their young people, too, with the whip and, far from wanting to do the same thing with our own children, I do believe that education is much too beautiful a thing to be crammed down any reluctant throat.

I think that we have to achieve what we must achieve by methods appropriate to our democratic way of living, and I think these results can be achieved. I believe that the highest results always come from spontaneity and not from necessity.

As a piece of general philosophy, I should like to add, however, that in our democracy we have too often been led by the needs and the desire of the average man and, if I may use a thoroughly unmathematical expression, this has led to a situation where our average has fallen below the average. I believe that it should be considered a normal achievement in any person and in any child that he or she should excel in a particular field, whether it be history or painting or mathematics.

The feeling that I can do something much better than anyone in sight is a great source of satisfaction and not the kind of satisfaction that leads to inactivity.

In continuing to compare ourselves with the Russians, I would like to say that there is one point where the Russians have done better than we have and where this comparison must turn out painful to our own side. I think that nothing is gained by minimizing this.

The Russians have a very high respect for scientific achievement. This is evident in what they have accomplished. It is evident in the literature that comes out of Russia. It is also evident from the stories that we hear from our many friends, from some of my scientific friends who have visited in Russia. They find that they are welcome and that they can talk with the man in the street, but those of them who can talk Russian, and there are not many but a few, find that the moment they say "I am a scientist," that kind reception turns into an enthusiastic one. Nothing similar to that have I ever encountered or heard of in this country.

I also should like to say that there is a general hope throughout our country that education as it is proceeding in Russia will liberate Russia. I certainly would say that education and intellectual accomplishments, wherever they occur, even when they occur in Russia, are something that we must welcome; but to place too many of our hopes on any idea that the Russian system through its technical and educational procedures will be self-correcting, this hope I personally do not have.

Let me give you an illustration why I do not have such a hope. Some of us have gotten into discussions with visiting Russian scientists, and our visiting scientists in Russia have gotten into discussions and very often on political matters. One statement we hear repeated from our Russian colleagues is this: "What do you want? What are you criticizing us for? We have freedom of speech in Russia."

When you talk to such a person, it is obvious that he is honest. It is obvious that he means it. Now, this is, of course, absurd. We know perfectly well that there is no freedom of speech in Russia. Then when you go into this matter and discuss it with them a little bit, it turns out that what they mean is something very concrete and very simple, but also something very different from what we mean when we talk about freedom of speech.

A few years ago in Russia, there has been very crude and very senseless persecution of certain scientific ideas. Of these, the best known is the Lysenko case where modern achievements were ruled out as unholy simply because the books of Marx and Engels did not contain them. This idiotic mispractice, which has not been limited to the fields of genetics, but which has affected great portions of Russian science, this idiotic malpractice has been discontinued and Russian science is now essentially free.

This, incidentally, only gives us additional reason to worry, because, if they had been effective up to now, how successful are they going to be from now on?

These Russian scientists were talking about the fact that in matters of science they can now say whatever they like. The idea that they may criticize their Government in political matters did not even occur to them. If we say that we can do it, they just laugh. They believe that we are hypocrites. In a part of the world which has been from the times of Genghis Khan under a tyrannical rule, the idea that the individual can say what he chooses in matters of politics and matters of importance is to them an impossibility. That this system will be changed, that this tradition will be abandoned within a short time due to some technical competence of a small percentage of their people, seems to me wholly unrealistic.

Mr. GWINN. Doctor, outside of their field, they may be like we are. They do not care much about the political life. Therefore, they do not care to exercise freedom.

Mr. TELLER. I believe that this is so. I also believe, however, that they have been taught that it is not good for them to exercise this sort of freedom and therefore, in the minds of most persons, an expression of opinion in this sense, an expression different from what they read in the newspapers, what they are supposed to say just does not occur to them. It is not done. It is not right. It is not possible. No one ever heard of such a thing.

This at least is my impression and my opinion.

Mr. GWINN. It would be a good excuse for a lot of our folks if they had that kind of background. They would not have to take any interest in politics.

Mr. TELLER. Sir, I have been educated in a different country and I must say that the interest that the common man in America has for politics and the feeling of some responsibility has impressed me. The

knowledge of the average man may not be very deep and very thorough, but he has some knowledge, and in other parts of the world this is not so.

I would like to talk perhaps about the situation in elementary and high schools just for a moment, not so much to repeat the fact which is obvious, that we are not stimulating excellence but just mediocrity, but that we are encouraging mediocrity rather than stimulating excellence, a thing I have implicitly said, and I do not want to belabor it now.

I would rather like to talk about at least some possible ways in which we can help in the present situation.

In the Elliott-Hill bill, and also in the administration bill, I have seen some proposals about counseling in our high-school system. I think that to have highly qualified people in the fields of mathematics, sciences, and some matters connected with engineering, if there are such counselors who can make the rounds who can pick out the gifted student, give him some guidance, stimulate his interest, I think these are excellent ideas. I do not believe that they are the only things that we can do, but it seems to me that this counseling service could develop into a very long step in the right direction, and I certainly hope that this feature of the pending bills will be enacted into legislation.

I also believe that we are in very bad need of summer schools for our teachers. Our high-school teachers and our elementary school-teachers are badly deficient in knowledge in the sciences, and I mean the physical sciences where our great need happens to lie, not biology but the physical sciences. They are deficient in that. They are deficient in mathematics.

A child's mind is much more receptive to abstract thinking than the mind of an adult. Abstract thinking is in many ways like a game. It is a fact that many of the world's most outstanding mathematicians and theorists made their great contributions below 30 years of age, some of them when they were younger than 20.

Among the latter, I should mention the greatest mathematician of all, the German Gauss; also the great French mathematician, Galois, who was killed in a duel when he was 21 years of age, and by that time had made the most outstanding contributions to mathematics.

Among other names with which you are thoroughly familiar, although they did their work a little later, but still well before their 30th birthday, I should mention Albert Einstein, Neils Bohr, Isaac Newton.

Our educational system does not take advantage of this great propensity of young minds in science. Talent, to my mind, is not something that exists or does not exist. It is not a mental power as some too simple representation of aptitude tests would have it. Talent is something like a very great and specialized interest. It is like falling in love, but if you don't know of a subject, you cannot fall in love with it.

It is not too early for a child of 10 to be interested in mathematics. He should begin to be exposed to it in the form of puzzles when he is 6 years old, yet the single high-school teacher who is guiding him probably has not a ghost of an idea what mathematical or physical sciences are about.

I think that summer schools not only for our high-school teachers but also for our elementary school teachers are very important. I furthermore believe that in these summer schools the studies that have to be not only stressed, but I would say exclusively considered, are the studies of subject matter in particular in neglected fields of physical sciences and of mathematics.

We are living in a world which is transformed by science from decade to decade. Yet our children remain ignorant and all of us are largely ignorant about matters which make our society click, at least as far as the material aspects are concerned.

And we furthermore remain ignorant about the great amusement value which is in a way the same thing as the great intellectual value that you can derive if you begin to look into the details of the working, not only of our machines but of big functioning universe of which we are a part.

We do not have a well-rounded education because we remain ignorant of science. And most of our teachers themselves are ignorant of science.

Mr. ELLIOTT. Dr. Teller, may I interrupt there?

Mr. TELLER. Certainly.

Mr. ELLIOTT. We hear a great deal in this subcommittee about the fact that if you emphasize the physical sciences now in the teaching in the schools and counseling and guidance, you will neglect the humanities, so-called, in so doing and create an imbalance in favor of the sciences that will not be good.

I would like to have your comment on that.

Mr. TELLER. Mr. Chairman, I am very grateful for your question, and I should indeed like to comment on it. I should like to comment on it in three parts.

First, I would like to say that we are in danger, and I will say in mortal danger, because the Russians are overtaking us in the physical sciences in this one special field.

To my mind, this is an emergency. It is not an emergency which will make itself felt in a year, but it will make itself felt in 10 years, and then it will be too late.

The second part of my answer is that there exists today an imbalance which has to be corrected. I heard once the statement that nuclear tests could tilt the earth axis by as much, if I remember the figure correctly, as 27 degrees.

Now, in science, this is as mistaken a statement as if somebody in history would have said, "Well, Alexander the Great, yes, I heard of him. He was one of the best generals that Napoleon ever had."

It is an absurdity that one of our best people can make so mistaken a statement. It shows how much off balance we are today.

The third remark I would like to make is this: In my own limited field I have often seen that if you strengthen one kind of research, one kind of worthwhile endeavor, it will not weaken the other. It will stimulate it.

One of my good and much honored friends, Dr. Lawrence, I have admired for many reasons, but perhaps more for this reason, that whenever the question comes up that another institute should get an excellent piece of apparatus, you sometimes are apt to say, "Well, we are better in Berkeley. We should get that piece of apparatus."

But Lawrence says, "That's a worthwhile thing. Let the others have it. If they get it, we will get it, too, sooner or later."

I think that if a person sees a need in, let us say, the teaching of history, he should present this need. If, instead of presenting his own needs, he opposes the need of another field because he imagines that this will hurt him in the long run, then I think he is narrow-minded.

Will you accept this as an answer to your question, sir?

Mr. ELLIOTT. Yes, sir. Thank you very much.

Mr. GWINN. Mr. Chairman, may I further bring out that point?

Then, if we stimulate our research in science in order to meet a threat, or if we respond to the stimuli to improve ourselves in research and science to meet even a Russian threat, it would follow from your argument that that will stimulate our learning and interest in scholarships generally.

Mr. TELLER. I believe so, sir.

Mr. GWINN. Whatever the motive that we may have then to emphasize scholarships, the result must be good generally.

Mr. TELLER. I believe so, because in science we have learned a number of very wonderful things which are important not only because they can produce more practical or more destructive machines, but which are important also because they are most surprising and throw a new light on the universe around us.

The ideas of relativity, the ideas of the structure of the atom are by no means as difficult and as inaccessible to the common man as they are represented to be.

I think that these subjects are and should be of great stimulation to the philosopher and, from thereon, to many other people in our society, including perhaps, maybe, even the poet.

I believe firmly in the unity of the intellectual effort, and you cannot help one field without helping all of them.

Returning perhaps to immediate practical matters for a moment, I would perhaps like to take the liberty of repeating before you a suggestion which I made before Senator Hill's committee. I am not certain that this is a good suggestion, but something like it might be worth while. This is something to remedy, quickly at a small cost and, yet, to some extent at least at the moment, effectively, one of the great deficiencies, namely, the deficiency that we are so badly underpaying teachers.

I would like to formulate this proposal for the special field of mathematics and the physical sciences, because that is where the desperate need lies, and that is the field in which I am competent. I am limiting it for these reasons only.

I would like to suggest the establishment of an honor society of science teachers. If a teacher is elected into the honor society he will have no additional duties. But, apart from the honor, he will draw an honorarium which is equal to his salary as a teacher. He will double his salary, and, yet, he will get this comfortable amount of money only as long as he remains a high school teacher or an elementary school teacher.

The way I would select these people is perhaps a little unorthodox, but I would want to select them approximately along such a line: I would do it by competition, not between the teachers but between

the kids. We have all kinds of science fairs and science competitions which the kids take because it is fun. This is a good thing. We should have more of it. That teacher who produces a particularly great number of big winners and little winners and runnersup is the one whom we want to have. I don't care by what method he produces these outstanding results as long as the results are produced. I believe that it will be soon found that the best way of producing these results is by awakening the interest of the children, and one of the important advantages of the proposal is that the teachers will be on the lookout for the kind of talent, the kind of falling-in-love which is an unmistakable sign in a child that he can go far.

It is this excellence in a particular field which I think is so valuable, and if we take the most successful 5 or 10 percent of our elementary school and high school teachers, then I believe that we, with a big but limited amount of money, can produce a very great deal of good; and even a smaller percentage of our teachers in this honor society might already begin to produce the right results if the best ones are indeed selected.

I am afraid I have spent too much time on matters other than higher education. I have done it because I believe that, comparatively speaking, our higher education is in good shape. Our colleges and universities are generally good, if not uniformly excellent. They can be improved. They must be improved.

However, I think that the most tragic situation and the most desperate need for reform is not in this field.

I would like to talk about a number of concrete questions which have come up and on which I feel that I should comment to the best of my ability, even though some of the things I may say may turn out to be indecisive, and other things may turn out to be just mistaken.

First of all, there is a lot of attention paid to the question of scholarships for a college education and for undergraduate studies in general. It is obvious that this is an important question. I heard a lot of debates and I have not made up my mind who is right. Some say that this is the clue to our whole higher education. Some say—and I tend to believe it to some extent at least—that the top 10 percent of our young people already find it possible to carry on their education; that, of the top 10 percent, 80 or 90 percent carry on anyway. Yet I feel that creating more scholarships, while not the most important point, is still an important and worthwhile thing.

As to the number of these scholarships, I understand that the administration bill is talking about 10,000 per year whereas the Elliott-Hill bill is proposing 40,000 per year.

My feeling is that if this measure is at all necessary—and I think there are good reasons to believe that it is—I would favor the bigger number.

That may seem inconsistent on my part, but my reasoning goes like this:

We had a few years ago a law which I thought was a very good one, the GI bill of rights, and this law took care of many of the things which these scholarships would accomplish. The GI bill of rights took care of a much greater number of students than either of these two bills. Yet it was during the very years that the GI bill of rights was in force that the Russians were very rapidly gaining on us in education.

I am saying this because I feel sure that, whether the scholarships are needed or not, they are not the only remedy. I am saying it, furthermore, because I believe that such scholarships will be really helpful only if, at least in some features, the bill will do better than the GI bill of rights, because, in sheer numbers, even the 40,000 per year would not come up to the standard of the GI bill.

The kind of thing that you can do in order to have the scholarship program really give the maximum benefits would be to have a careful selection of the people who are eligible, and I know that this is in the plan. I believe that this is an extremely important point of view which must receive a lot of attention.

I have heard another proposal which I think is an intelligent one, although it is a complicated question and I am not sure of it.

I understand that many of our really good people drop out not when they finish high school but earlier.

By this I do not mean that some of our best kids do not finish high school. They do. However, by the time they are juniors in high school, and some of them even by the time they are sophomores, they realize that, because of some reason or other, like a family reason or financial reason, they just cannot afford to go to college. That is not for them. So their interest goes into other directions. They know there are scholarships available, but who knows whether this particular kid will get it, and he says, "I will just have to go out and work for myself. I cannot do this."

Mr. GWINN. Doctor, may that not be because of what you have already mentioned—a lack of interest and enthusiasm for scholarships?

Mr. TELLER. I believe that is so, indeed. I agree with you, but I would specifically want to propose that some of these scholarships, a certain fraction of them, be earmarked for or promised to a student not when he leaves high school but, let us say, at the end of his sophomore year.

You might say to a number of kids in needy circumstances who had up to then an excellent record in school, "If you maintain your record, then by the time you are out of high school a scholarship will be available to you."

Mr. WAINWRIGHT. I do not quite follow that. Do you mean that you tak a gifted child who is, say, a sophomore in high school——

Mr. TELLER. Who has finished his sophomore year.

Mr. WAINWRIGHT. Do you mean that funds should be granted to him at that time because he is in a position where, say, he has to quit high school and go to work?

Mr. TELLER. No, sir, that is not what I meant.

He should not get any money. He should get a promise.

Mr. WAINWRIGHT. That would be an incentive to keep him going.

Mr. TELLER. Yes, just the incentive.

If he maintains his record, then at the end of his high school education he will get this scholarship without any further questions asked.

Am I making myself clear?

Mr. WAINWRIGHT. Yes.

Many scholarships are given in current practice today by the various universities, including the university I went to, at the end of the student's junior year in high school.

Mr. TELLER. I heard complaints at the University of California admissions office that, for instance, in California at least we do not have that system, and we are suffering from it. That is the reason why I mentioned it.

Mr. HASKELL. Are these scholarships to be based on need and merit both?

Mr. TELLER. I would like to say that I don't want to get into the difficult question of need generally, but I would say that if you go out of your way in promising a scholarship early if a kid has ability, if he has the money, but his interest veers away from a college education, I doubt that the scholarship will make any difference to him.

I think that I could say a lot in favor of giving the scholarships in the end on the basis of merit alone and not of need. I can also argue on the other side, but in this case, where I talk about the sophomores, I am trying to remedy a really existing trouble which arises from the fact of need, and for that reason, in this special case, I would base it on need and merit; yes.

Mr. ELLIOTT. The gentleman from California.

Mr. HOLT. Dr. Teller, I am from California, and I agree with you. A lot of youngsters lose when they get to be seniors. What concerns me, however, and other folks testifying before this subcommittee—and I am a visitor; I am not a member of this subcommittee—is how you go about selecting these youngsters.

Mr. TELLER. Yes, sir. I do not know.

Mr. HOLT. Here is another problem this committee faces:

Some folks have said, in very high scientific places—I think one of them was Admiral Rickover—"Don't bother to stimulate the local school authorities or the State."

What concerns me under our system versus the Russian system is there is a lot of good talent lying dormant in our State educational system, in our local school system. How do we, as the Federal Government, without the Government taking over as a czar, stimulate that activity so they find these sophomores and give these scholarships? Do you have any recommendations along that line?

Mr. TELLER. I wish I would have. I will try to talk about it for a moment, but I must say it is an awfully difficult question.

Mr. HOLT. I do not want to interrupt your train of thought.

Mr. TELLER. No, you are not, and I am very grateful for your question.

I would say this: Tests are an indication; they are not more than that. They test speed and presence of mind. These are qualities which are important in many walks of life, but not in science. Nevertheless, tests are the only objective indications we have at present, and, therefore, to some extent, we will have to rely on them.

There are other things. We can look at the school record. We could look at the recommendations from teachers, and these are very important things. I would rely on those. I would rely on accomplishment in examinations, not tests. After all, what a child already knows is due to his past interest, and that is an indication of how good he might become. The old-fashioned method of examinations on subject matters is a good way to stimulate people and to select those who have a real interest.

I know that this is not a good answer. It is the best I know how to give at the moment.

Mr. HOLT. It is the best we have here, too. Thank you.

Mr. TELLER. Thank you, sir.

I would like to say a number of other things, and, in particular, I have listened with great interest to your discussion here a short time ago about the question of military service. This is a difficult question and I don't want to go into it at all in a general way, but I would like to make a very special and limited suggestion which I think might be practical and easy.

We are in desperate need of physical science students and mathematics students. These two fields are closely connected. I would also add engineering, the three making essentially one unit—physical science, engineering and mathematics. We are in desperate need of these people in our government laboratories dealing with military matters. We are, furthermore, in desperate need of these people as teachers in high schools and elementary schools.

I would like to propose that, if a person has an advanced degree in any of these subjects, that is, if he has a masters or a doctors degree in engineering, physical science or mathematics, then he should be not deferred but exempted from military service, provided that he does something for the Nation instead of the military service. And I would propose that what he may do, instead of the military service, would be either that he work for 2 years in a Government laboratory where defense matters are handled, or that he teach in high school or elementary school for 2 years. This would be a civilian occupation and, for most people, a more agreeable thing.

He would get better pay than if he would join our Armed Forces. He would have more freedom and, most of all, he would do things that directly advance him in his career. Furthermore, he would not be so exempted unless a school or a Government laboratory is asking for him; and if they are not satisfied with him and they discharge him, then, of course, he would not have escaped, under the present conditions, his obligations to do military service. But, if he is needed and if he is wanted and he is willing to do that, then I think he is performing a much more needed and much more urgent service, and, at the same time, all of this might help to give a little bit more prestige to a general kind of occupation, working in our Government laboratories and teaching science to our kids.

These are two things which do not even have the little glamor that sometimes attaches to basic science. I think these are the fields in which we need help most desperately, and I think that might be at least a temporary measure in which we could provide relief immediately.

I would like to come to a few other points which I consider quite important, although they might be difficult or impossible to enact into law.

I have essentially three things on my mind which I want to mention quickly. One is a question of foreign students.

We have in this country more than 3 million of our own kids studying in our colleges and universities. We also have some foreign students here. I understand that the approximate number—please do not hold me to it as it is not based on detailed research, and I got the

information as quickly and as easily as I could, and I believe it is not completely mistaken—is 30,000. But I may be mistaken.

This is 1 percent. This is too little.

I believe that contact between our children and children of other countries, our youngsters and youngsters of other countries, and, precisely, contact on the level of higher education in our colleges and universities, would be one of the most effective things we could do to produce a beneficial effect for our country and for the whole world.

I told you—and this is true not only of the Russians but of many other people too—that if we tell them we have freedom in this country, they don't understand what we are talking about because they do not have the same condition.

I have often seen that, because of the long and wonderful tradition of freedom in this country, we have forgotten how exceptional this freedom is, and only by bringing people over here and showing them in really great detail can they begin to realize what we have here. At the same time, we are not going to survive in the coming difficult decades unless we, and particularly our most gifted children, have a thorough understanding of what is going on abroad and what is in the minds of the talented people abroad.

This is a two-way street. We need much more mutual understanding.

I would like to see that additional 100,000 students from abroad be maintained in this country. By maintain I mean not 100,000 per year, but that the number of additional students be built up and kept at a level of approximately 100,000, increasing the total number to maybe 130,000, something like 4 percent of our own students.

This will require money. I think that this money will be exceedingly well spent. I think that the need is very great indeed.

Incidentally, I would say that if this is supplemented by sending our children abroad, this is a very important measure, and I would, by no means, want to limit the proposal to science students.

If, incidentally, these young gifted children from abroad get job offers here and, in the end, stay here, I would not be opposed to it. I myself came to this country when I was relatively young, and I am very happy that I was given the opportunity to stay here, and for me to argue that this is a wrong procedure would be most inappropriate indeed.

However, if many of these children go back to their countries they will be ambassadors of good will, and I am sure that they will be a most valuable asset that we will have acquired.

I neglected to say one thing a little bit earlier, and I will mention it here out of context.

I said that I have some doubts about scholarships, although I rather believe that it is a good idea.

I have no doubt whatsoever about fellowships. Many of our young people marry while they are studying and do not wait for advanced age, and I think that this is a good idea. This, however, puts a considerable amount of pressure on them, and many of them do not finish their educations, probably because the financial and home pressure on them is too great.

Postgraduate fellowships are among the most important things that I can think of. I would like to see these given under a quite flexible

plan, and I cannot tell you in what way they can be best given and administered. But the kind of number you mentioned in your bill, sir, 1,000 to 1,500 per year, is, to my mind, a minimum number. I think, if at all, more of that kind should be going on, and if that is subtracted from the scholarships, I certainly would not mind.

I would like to mention two other general things. One is I would like to stress the great technical need which we have, and in this matter I think I can talk from firsthand experience.

In pure science we are still, as far as I can see, ahead of the Russians, although we may lose this lead.

Mr. ELLIOTT. Would you define pure science right there as you mean it?

Mr. TELLER. Pure science is something which I like very much, which is my field. It is research arising from intellectual curiosity.

You are working in pure science when you are working and working very hard in order to find out things so that you know how the world hangs together, and you do it without any kind of consideration of whether it ever will lead to any useful result.

It usually turns out that such endeavors pay off and pay off much more greatly than those things which you set out to do with a definite aim in mind. We are generally good at it, although pure science has been fragmented to too great an extent. We have too many specialists and there is too little contact at the base. We have developed into a great number of special kinds of highbrows who do not even any longer talk to each other. Every little group goes off in his corner and cooks his own soup. This is a pity.

We also still have a respectable number of engineers, although there we may be slipping compared to the numbers that are educated in Russia. Where we are really short, however, is in applied science. The engineers are usually pushed into a practical direction where they want to get results and where they do not care very much about getting deeply into the scientific foundations. The pure scientist turns up his nose at anything applied. This, I think, is wrong because the pure scientist can learn a lot from actually trying to get something accomplished.

What I especially want to say is that this country has four good institutes where applied science is stressed. These are the Massachusetts Institute of Technology, the California Institute of Technology, the Carnegie Institute of Technology, and Case Institute. They are good, but they are not sufficient. We need more of the same kind and more stress on this in our universities. We need to cultivate the field which is somewhere in the middle between mathematics, chemistry, physics, and engineering.

Let me give you an example. We are great in solid state physics, and we have found beautiful methods, which I am most interested in, as to how nuclei orient their spins within solids. Please don't ask me to explain what all this is. It is something very interesting and something not terribly practical at the present time.

But we know very little about the corrosion of metals. The Russians probably today are better in metallurgy and corrosion studies than we are. The engineer does it by traditional methods, by old-fashioned tests, and stops there and does not think about the structure of materials. The chemist goes on into the most modern theories of

chemical bonds. The physicist, having understood the properties of crystals in general, has proceeded by now to forget about it. As to the person who really sits down and tries to say, "Now, why is this additive so important in making a substance heat resistant or chemically resistant," the number of people who do that in a basic way, starting from the fundamentals and carrying it through to the practical end, is tragically small.

This is only an example and this example is the one which will determine whether we shall or shall not make the best nuclear reactors, because that is a question of corrosion; and whether we shall or shall not make the best missiles, because that is a question of high temperature resistance of materials. We are poor in this.

I wonder whether there would be a possibility in establishing a national institute of applied science in which those parts of basic science are emphasized, which have most bearing on engineering and in which engineering problems are attacked with the best methods of modern science. We can do it without subtracting too much from existing institutions. We should establish such an institute with very high salaries and great prestige, something like an institute of advanced studies in the field of applied science. But the institute should also educate students—I would like to see the students in there from the undergraduate days on; because the young minds are the most important ones. In order to make all this possible without detracting too much from our strength in our other universities, I would be very liberal in bringing in gifted young researchers, and I would also be liberal in inviting people from abroad. We have need for contacts, for more cooperation with applied scientists abroad.

I have mentioned metallurgy. I would mention meteorology. I should mention oceanography. I could mention many other fields. I could mention the very important field of modern computing methods in which we have made lots of progress, but in which lots more could be done. Automation is closely connected to it. There are many other things. All these should be cultivated in the institute of applied science.

Mr. HASKELL. Would not the training of a fundamental research scientist or pure scientist be the same as an applied research man? Would not his training necessarily flow from the same source?

Mr. TELLER. If you ask the question in a very formal sense, the answer is yes. If you extend the question to points of stimulation, points of emphasis, then I would say no.

The way most of our children are brought up in is that they only see the fundamental stuff, and by the time they grow up, if they have been good in their field, it is firmly established in their mind that if they are good they will not do applied work.

Mr. HASKELL. I know you do not have the time now. Do you have a paper on this?

Mr. TELLER. No, I do not. I am awfully sorry. However, the main point I am trying to make is this, that the influence a professor has on his student is very great. If his own interest is at least to some extent in the applied field, if he selects his examples from the applied field, it gives an entirely different color to education.

Let me go into a special field—mathematics. There is an extremely interesting new field in mathematics in which I have been interested

and which is popular among mathematicians today. Let me mention one of them.

Mathematicians used to believe that there are only two possibilities in mathematics—a statement may be either true or untrue. It has been discovered that a statement might have the completely crazy property that neither is it true nor is it untrue. At least neither alternative can be definitely proven.

This is an extremely interesting part of mathematics which, however, at present has no practical application whatsoever. Yet it is siphoning off an exceedingly great portion of our best mathematical minds.

It should be encouraged, but the other field of what is called analysis, the methods by which real calculations can be performed, calculations which are closely connected to the physical sciences, calculational methods which are, for instance, wonderfully pursued at New York University under Professor Couvant in his Applied Mathematics Institute, these fields suffer.

Now, if these branches would be emphasized, if in engineering we would have a lot of reactor engineering, if in chemistry we would have a lot of metallurgy, if in physics we would have a lot of solid-state physics which is connected with the disposition of atoms and what happens in the surfaces between crystallites in a metal, if in mathematics we would emphasize calculational methods, I think we could go very far.

In other words, there are a lot of very important things which applied institutions could do. These things are being emphasized in those four institutions which I mentioned, but I think that this is not enough.

Mr. HASKELL. Would this institute concentrate on changing the curriculums and the teaching methods in the present universities, or would it be an institute to train individuals?

Mr. TELLER. I had in mind that it would be an institute to train individuals; an institute, furthermore, where a lot of applied research is going on for its own sake, and which thereby, both in research and education, should set a high standard, a point for which to shoot for other institutions and for the other universities as well.

Mr. GWINN. Doctor, it is a great treat to hear you. I just remarked to the chairman that I wonder why such scientists and scholars as you do not write more so that at least Congressmen or people at that level might know about these things, and so that persons with funds might be stimulated to give gifts to just such an institution as you are talking about, as they gave to California Tech and Massachusetts Tech. Maybe even taxpayers might be willing to support it.

Mr. TELLER. Sir, we are trying to do our best. My day has only "25" hours.

Mr. HOLT. Mr. Chairman, if I might just comment.

Dr. Teller, I just ran into what you are talking about. I am chairman of the California Smog Committee.

Mr. TELLER. A very important topic; lots more dangerous than fallout, I can assure you. I mean it in the most literal sense of the word.

Mr. HOLT. When you mentioned meteorology it made me think of this: I had to gather together the Government bureaus that had to do with what is in the air. I had representatives of six bureaus

in my office, and none of them are coordinated at all in the Federal Government.

Mr. TELLER. There is one more topic which I am very anxious to mention, and that is the topic of books. I do not suppose you realize that technical books—I don't mean books of popular science, but good, hard technical books—have a very much greater circulation in Russia than they have in this country, and they have had that greater circulation for decades.

Please do not imagine that the Russians have gained their present advantage in the last few years. That has been a well-laid plan, and a lot of hard work has gone into it.

The interest in Russia is greater. Also, books are cheaper.

I have brought along a book which I have borrowed from a friend in the Atomic Energy Commission. This is a very excellent book. There are others of the same kind which are also very good. I don't want to advertise this book in preference to every other one, but I have used it for very many years. It has been first published in 1914. And it has been reissued since then almost every year. It now contains a little bit more than 3,000 pages, and if I want to find help in properties of materials or look up some logarithms or find out almost any simple fact in physics or chemistry, that is what I look into. It is called Handbook of Chemistry and Physics. It is the 38th edition, and everything about the book is wonderful except one thing—its price. That also is wonderful. It is $12.50.

This book should be selling for not more than $1, and it should be in the hands of every student, graduate or undergraduate, who is interested in the physical sciences.

I am saying this not because I hope this will happen to this particular book. I am saying it because I hope that this will happen to many good books. We must stimulate the writing of really good books.

This is not a textbook. It is a reference book.

Mr. WAINWRIGHT. Who is the publisher of that book?

Mr. TELLER. The Chemical Rubber Publishing Co. in Cleveland, Ohio.

I think that, by prizes and honors and a lot of publicity, one should encourage, federally encourage if need be, the writing of good books. And then one should, encourage the cheap distribution of good books. One should do this by any means, by using the Government printing press, by buying up the really good books and issuing cheap editions, by subventions, by whatever legal means are possible. We must look to it that the really good books should be cheaply available so that our people should be able to build up inexpensively really good libraries.

There is no possibility of really good science, really thorough science without a good library. Yet, in books we have priced ourselves out of the market.

This is essentially all I want to say. I feel the need is urgent. I feel that the proposed reforms are good. I feel that there are many additional things that have to be considered. I feel that lots of experimentation has to go on, that many of our attempts will miscarry.

I have the hope that, our many independent institutions of higher learning, our States with their different lower educational systems, will make many experiments in education. Some will succeed and

some will fail. But in this manner we shall find out the best ways in which to give the best possible education to our children.

But I do feel that we have come to the position where the Federal Government must understand where the need is greatest, and the Federal Government must effectively help.

Thank you, sir.

Mr. ELLIOTT. Thank you very much.

Let me say to the members of our subcommittee here that Dr. Teller told me some time ago that he had a very important engagement at the Pentagon for which he would have to leave at 12 o'clock. We have kept him 3 or 4 minutes later.

In view of the commitment I made to him, I wonder if, with the permission of the committee, he might be excused or if we could hold our questions down.

Mr. GWINN. Are we not going to be able to see the doctor any more? Is this goodby?

Mr. TELLER. Sir, I have said everything I had on my mind. If you want to question me, I must say it is with very great regret that I have to rush off, but this appointment has been made some time ago with General White and I just must be there. I could come back this afternoon if you want me back for questioning. I am sure you are more busy than I am. Probably I have already talked too much, and I don't think I should be needed. But, if I am wanted, I will be here.

Mr. WAINWRIGHT. Would that interfere with your afternoon plans?

Mr. TELLER. I plan to go back to California at 11:55 tonight, and I hope you don't keep me that long.

Mr. ELLIOTT. Dr. Teller, the membership of this subcommittee is deeply appreciative of the contribution you have made, and we wish you Godspeed and good luck.

Mr. TELLER. Thank you very much, sir.

Mr. ELLIOTT. Our committee will meet tomorrow morning at 10 o'clock, at which time the witnesses, the gentleman from California, Mr. Roosevelt, the gentleman from Ohio, Mr. Ashley, and Dr. J. C. Black of the Eastern Kentucky Teachers College of Richmond, Ky., will be heard.

(Whereupon, at 12:10 p. m., the committee adjourned until 10 a. m., Tuesday, March 4, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

TUESDAY, MARCH 4, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION
AND SUBCOMMITTEE ON GENERAL EDUCATION,
COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10:20 a. m., in room 429, Old House Office Building, Hon. Carl Elliott presiding.

Present (Subcommittee on Special Education): Representatives Elliott (chairman), Green, Wainwright, and Nicholson. (Subcommittee on General Education): Representatives Bailey, Udall, Gwinn, and Lafore.

Also present: Representatives Perkins and Roosevelt.

Staff members present: Charles M. Ryan, general counsel; Kennedy W. Ward, assistant general counsel; Mary P. Allen, clerk (Subcommittee on Special Education), and Robert McCord, clerk (Subcommittee on General Education).

Mr. ELLIOTT. The Subcommittee on Special Education, meeting jointly with the Subcommitee on General Education, will be in order.

Our first witness this morning is Representative Thomas L. Ashley of the Ninth Congressional District of Ohio. Congressman Ashley has manifested his interest in education by introducing H. R. 5763, a bill providing a program of scholarships for students in science and education. His bill is pending before the Subcommitee on Special Education now.

You may proceed, Mr. Ashley, in any manner you see fit.

STATEMENT OF HON. THOMAS L. ASHLEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OHIO

Mr. ASHLEY. Thank you, Mr. Chairman. It is a privilege for me to appear briefly before this subcommittee which in such a short period of time has gained a truly excellent reputation for the work which it is doing.

I am aware, Mr. Chairman, of the high caliber and very real qualifications of the men and women who have already appeared before this committee, so let me say at the outset that I come here not as an expert in education, but simply as the author of a bill establishing a national scholarship program.

As you know, Mr. Chairman, we do not have to be experts to be authors of very important legislation.

Mr. ELLIOTT. I would like to say to the gentleman that I consider Members of Congress as being expert observers in the field of not only

education but economics and everything else with which they are concerned in representing their constituents.

Mr. ASHLEY. I do not think I would take too much issue with the chairman on that.

I might say, Mr. Chairman, that this bill was first introduced more than 2 years ago back in the presputnik era when Congress was more concerned with classroom and school facilities than with the crying need for more teachers and scientists.

Very briefly, my bill would create 50,000 scholarships a year for the next 10 years for students entering the field of education, 20,000 undergraduate scholarships a year for 10 years for qualified students in the field of science, and 5,000 postgraduate scholarships a year in the field of science.

The bill calls for the establishment of a National Board on Scholarships, consisting of a Director, appointed by the President, and 16 members appointed by the Director, with the approval of the Secretary of Health, Education, and Welfare.

The bill makes provision for the holding of annual competitive examinations in the fields of education and science; it specifies the conditions of eligibility for a national scholarship, and it stipulates that the number of scholarships awarded to the students in any State shall bear the same ratio to the total number of scholarships available in education or science for that year as the number of high-school graduates in that State for the preceding calendar year bears to the total number of high-school graduates in all the States for such preceding calendar year.

Mr. Chairman, the bill provides that any student awarded an undergraduate scholarship can pursue his or her course of study at any institution of higher learning in the United States selected at the time application is made to participate in the competitive examinations.

With respect to amount, my bill provides that tuition shall be paid directly to the institution and that each scholarship student shall receive $90 a month for each month during any part of which he or she is actually in attendance. This amount is intended to pay living expenses, including meals, lodging, fees, charges, books, supplies, et cetera.

Because this bill is intended to stimulate academic activity in the fields of science and education, I have stipulated that scholarship entitlement will terminate if a student ceases to pursue a course of study in the field in which the scholarship was awarded, or if he or she fails to meet any of the academic, disciplinary, or other standards applicable to individuals pursuing that course of study at the particular institution.

Mr. Chairman, the principal reason that I introduced my scholarship bill 2 years ago was because I believed what I read about the tremendous scientific strikes taking place within the Soviet Union.

It is clear that the interest of the American people in this matter is not casual; it is vital and so imperative that the normal social processes are not adequate to meet our needs.

In an age when decades have shrunk to years, years to months, and months to minutes, I think you will share my view that we have no time to lose. I believe that the American people need a Federal program of aid to students to relieve the shortages which exist in the vital areas of science and education, and I believe that the national interest will be indisputably served by helping to provide appropriate educations

for those with ability, in accordance with the scholarship bill I have outlined.

I am sure this committee has received ample statistical data showing the alarming number of high-school students of outstanding ability who today do not attend college or who do not finish if they are able to start.

You have also heard, I am sure, that one of the major reasons for this tremendous waste of resources is simply lack of money. I am told that 7 out of 10 students who are capable of completing their college educations do not do so because of low-family income, and according to the College Entrance Examination Board, close to 100,000 students of superior ability do not enroll in institutions of higher education each year for the same reason.

It also goes without saying, Mr. Chairman, that the need is particularly great at this time for more college-trained scientists and engineers.

Very briefly, I would like to comment on the recent comprehensive study made under the auspices of the National Science Foundation, entitled "Soviet Professional Manpower," and statements by responsible United States Government officials to support the belief that we must do something to guide more of our young people into higher education.

In the study of professional manpower in the Soviet Union, Nicholas DeWitt concluded that the Soviet Union:

> has reached a position of close equivalence with or even slight numerical supremacy over the United States as far as the supply of trained manpower in specialized professional fields is concerned. The Soviet effort continues. Our own policies in the field of education and in regard to specialized manpower resources will decide whether within the next decade or so the scales will be tipped off balance.

I think that the comparison of the number of graduates in engineering in the Soviet Union and in the United States graphically dramatizes our disturbing dilemma. The number in the Soviet Union has risen from 30,000 in 1952 to 63,000 in 1955; in the United States the number has fallen from 30,000 in 1952 to 23,000 in 1955.

Mr. ELLIOTT. Let me ask the gentleman at that point, do you feel that the quality of the training of the Russian engineers compares favorably with the quality of the training of the American engineer?

Mr. ASHLEY. Mr. Chairman, the information which has come to me is largely from British sources, probably because British scientists have been given access to the various installations in the Soviet Union for a number of years, the last 2 and 3 years. According to the information that I have received from the Communists and other sources, the Soviet education in the sciences is extremely good, extremely high.

The thing that impresses me is the superiority of their scientific facilities, their plant. According to the British, they simply have not seen anything like it. It is superb.

Mr. ELLIOTT. Certainly we would be putting a very heavy load on our own engineers to assume that one engineer is equal to three Soviet engineers, would we not?

Mr. ASHLEY. That is exactly right, Mr. Chairman.

Mr. ELLIOTT. That is what your figure shows. You show that we are graduating about one-third as many engineers as are the Russians.

Mr. ASHLEY. We do not seem to know, or do not get from our intelligence people, information as to how good the Soviet training is, and I think for purposes of this committee and for purposes of the Congress taking appropriate action, we have to assume that the caliber and quality of the Soviet education is every bit as good as our own. If we underplay it, it can lead to disaster. If we overrate it, it can perhaps lead to an expenditure of money, which is unfortunate if not needed, but certainly would not jeopardize our national security.

Mr. ELLIOTT. In this field, if we overplay Soviet capabilities, we gain in the process?

Mr. ASHLEY. Precisely.

Mr. ELLIOTT. If we train more engineers of a higher quality than the Soviets have, we would still be ahead of the game, as I see it. We have nothing to lose.

Mr. ASHLEY. Exactly so, Mr. Chairman.

With respect to the national scholarship program, I would like to comment that not only are existing scholarship funds and loan funds inadequate, but I would like to comment, too, on the fact that a scholarship program of the kind that I have outlined would not involve controversies with respect to racial segregation and aid to private institutions.

I might go further, and say that I do not think that such a program could be challenged on the basis that it would lead to Federal control of education. There has been ample precedent for a scholarship program of the kind that I have outlined. Perhaps the most recent, of course, is the assistance which the people of the United States, through the Congress, gave to the GI in the GI bill program.

This proposal, Mr. Chairman, I believe would more nearly equalize educational opportunity for many of our youth. The Federal Government certainly is the only agency in a position today to finance a national program of this kind. It goes without saying that the States are so burdened at the present time with fiscal problems connected with the tremendous expansion now occurring in our elementary and secondary school systems that it is extremely doubtful if they could undertake to finance the extensive and complex system of schools that is necessary, and it is for that reason that I have not even put this on a so-called partnership basis.

I do not support the administration view that this should be on a partnership basis with the States. I think they have all they can handle, and for that reason I have set it up on a purely Federal basis.

I appreciate the opportunity of appearing before your committee this morning, Mr. Chairman. That concludes the remarks which I brought with me with respect to my bill, H. R. 5763.

Mr. ELLIOTT. I would like to say to the gentleman that we appreciate his testimony and his obvious intent and effort to be of aid to the committee. We hope to have the privilege of having him again.

Mr. ASHLEY. Thank you, Mr. Chairman.

(Supplemental information furnished by the witness follows:)

HOUSE OF REPRESENTATIVES,
Washington, D. C., February 22, 1958.

Hon. GRAHAM A. BARDEN,
Chairman, House Committee on Education and Labor,
House of Representatives, Washington, D. C.

DEAR CHAIRMAN: I am attaching hereto a proposal submitted by Mr. H. Leonard Richardson, assistant headmaster of the Maumee Valley Country Day School, Maumee, Ohio, for the establishment of a program of federally supported United States college preparatory high schools as a means of making the best possible use of our Nation's intellectual resources.

I believe that Mr. Richardson's recommendation merits the attentive consideration of your committee, and I shall greatly appreciate your incorporating his statement in the record of the current hearings on the omnibus defense education bills.

Sincerely yours,

THOMAS LUDLOW ASHLEY, *Member of Congress.*

AN INVESTMENT IN THE FUTURE
(AN EDUCATIONAL SUGGESTION)

(By H. Leonard Richardson, assistant headmaster, Maumee Valley Country Day School, Maumee, Ohio)

With each succeeding day, greater verbal attention is being paid to the vital necessity of educating our young men and women with greater depth and vitality. A hundred-year plan has been suggested; other similar, less long-reaching ideas have been voiced, but little concrete action has taken place. Immediacy is essential. Here is set forth in capsule form a plan suggesting a positive and presently feasible means for beginning such a program of education, utilizing the best resources our country can muster.

It is suggested that since our greatest problem today lies not in filling the great colleges and universities of our country but rather in providing for them well-trained students who can best utilize the facilities of these institutions, our emphasis be placed at the secondary level.

To fulfill this realization, it is further suggested that there be established in various central locations of the country United States college preparatory high schools with both boarding and day departments. Admission to these schools would be solely on a competitive basis, with little, if any, attention devoted to the relative monetary needs of the potential students.

Each of these schools should have a solid, though skeleton, corps of administrators, faculty, and operative personnel, but the majority of the faculty positions should be filled on a rotating system from among the finest teachers of the country. Every school, it seems, would welcome the opportunity of granting a year's leave of absence to such teachers in order to provide these teachers with a challenging opportunity and to give the best young minds the finest instruction possible.

Such a faculty could be chosen by a committee of educational experts from men and women recommended by administrators, parents, students, and intelligent lay people from all over the country, from public, parochial, and independent schools alike.

The mechanics of such a project could be worked out readily, and here, for a minimum of expenditure, a maximum of intellectual power could be developed. Part of the problem discovered in awarding the national merit scholarships lies in the fact that many of our ablest students lack the basic training necessary for achieving the optimum benefit from the first year or two of their college experiences. Through a thorough grounding at the secondary level, these students could be prepared for their future contributions to the country.

Mr. ELLIOTT. Our next witness today is Dr. J. C. Black of the Eastern Kentucky State Teachers College of Richmond, Ky. Dr. Black will be presented to the committee by the gentleman from Kentucky, Mr. Perkins.

STATEMENT OF J. C. BLACK, EASTERN KENTUCKY STATE TEACHERS COLLEGE, RICHMOND, KY.

Mr. PERKINS. Proceed, Mr. Black. I am certain that all the members will appreciate your views on this important matter of education, and I am confident that you have a statement that will prove very beneficial to the members of the committee in their efforts to solve this problem. You just proceed in your own way.

Mr. BLACK. I appreciate Congressman Perkins' courtesy.

Mr. ELLIOTT. Let me say that we have numerous witnesses who are seeking to be heard by this committee, and it is obvious that, if we do not set some reasonable limitation of time for them, we will be hearing witnesses at this time two years from now, in view of the fact that we have many interruptions. When, for instance, tomorrow the full committee meets, and probably it will meet the day following, that disrupts our schedule.

I want to say at this time that it is 10:35, and, according to the commitments of the subcommittee, if Dr. Black could finish by 11:15, that would be very helpful to the committee in getting to other witnesses that have been scheduled.

I say that, Dr. Black, not so much for your benefit as for the benefit of the members of the committee here. I am sure they will cooperate to maintain a schedule. You may proceed.

Mr. BLACK. Thank you.

I think perhaps it is best that I read a prepared statement. That shows more respect for the committee, I think, than for me to try to make extemporaneous statements.

Mr. GWINN. Mr. Chairman, on what point is the witness appearing.

Mr. ELLIOTT. What is the main point of the witness' statement?

Mr. BLACK. As I see it, the main point of my argument is that the thing that has to be watched in American education is who controls the money and who controls the policies. My point is that we must get some subject matter taught in the schools, get the frills out of the schools, get some of the superfluous courses out of the schools, and get down to rock-bottom education in the schools.

That is essentially my point.

If the same group who have been largely in control of the policies of the schools for many years control the policies and the money now, then it seems to me that we are in a bad way.

Mr. GWINN. I am glad I came.

Mr. ELLIOTT. You may proceed, Doctor.

Mr. BLACK. Of many problems confronting American education, one only is discussed here; namely, what group of people will establish the rules and control the flow of money which Congress may provide for the improvement of education.

Discussion of this problem requires consideration of two distinct groups in American education. One group is the subject matter people who wish to teach history or languages or science with strong scholastic standards. They generally have excellent knowledge of and enthusiasm for the subject.

The second group are the professional educators, and I want you to understand, please, that I do not use that term in any name-calling or derogatory sense. That is the term which is properly used in

connection with the people whose philosophies and thoughts deal in professional education. I want you to please understand that it is not a derogatory type of statement. Their training leans heavily toward educational methods and philosophies, and their attitude toward the classroom is much less serious than that of the subject matter people.

They use the phrase, "Teach the child, not the subject," but there is some doubt as to just what they teach the child. They believe in letting the child progress at his own rate, claiming that giving the child a low grade might discourage him, and they sometimes promote him whether he tries hard or not in his classes.

Judging from present articles in the press, these people think that our schools are excellent. They believe we need more buildings and money, but they say nothing about changing the old policies. At least I have not seen much said about changing the policies.

I think there is a little lipservice about changing policies, but I do not see much real statement about changing policies.

While it is obvious that great amounts of money are needed, it is obvious that there are very few children in the United States who will not have an oportunity to be in some type of classroom tomorrow morning and this morning and have some type of teacher. Everyone should realize that more and better classrooms and teachers are needed.

A high percentage of the teachers who appear this morning will have bachelor's degrees which conform to the requirements set up by the group who have been in control of the schools for the last 30 years or so.

Then I have in bold print:

Why then does there appear to be a state of national emergency connected with our schools? We have many rooms, we have many teachers. We do not have enough of either nor high enough quality teachers. Many of these teachers have degrees, and yet we have an anxious Nation demanding to know why the children are not learning more. The subject-matter people, whose members seem to be academically much better trained and who outnumber the professional educators possibly 10 to 1, believe that our schools need radical improvement from the first grade through the college. They are less vocal. They are at fault partly and I am one of them. They are partly at fault. They are less vocal, they are less powerful, they are more retiring, and their jobs often depend upon conforming with or at least keeping in the good graces of members of the other group who are quite often in power, almost always in power. Thus perhaps 1 million subject matter teachers whose salaries figured at only $4,000 each—

and that is slightly below the average. The average for the Nation is about $4,300—would cost the taxpayers $4 billion annually.

Mr. ELLIOTT. How much is that?

Mr. BLACK. That is $4,000 each for a million teachers. Those figures are very rough, but there are over a million teachers. Some of those teachers fall in the other class of sympathizing with and going along with the professional education group, the more modern group, and I just chose that number in an offhand way. That is somewhere in the neighborhood of right.

Well, there is $4 billion. They have their effectiveness greatly reduced by the theories and policies of the less able and less devoted minority of the school personnel who manage to obtain positions of control. The subject-matter people are inclined to work quietly and modestly in classrooms and laboratories while the professional educators like to be out before the public maintaining close relationships

with the press and radio and securing jobs as principals, superintendents, and deans.

By means of State laws formulated by them, they have for years had almost complete control over the elementary and secondary schools as well as a large measure of control over the teacher-training institutions. They have also gained considerable influence in some of the better known colleges and universities. They are gradually creeping into those.

Here is an interesting thing that has to be watched in American education. They have the title "educators." Having the title "educators," they have capitalized on the word "education." You have to watch the use of the word "education," whether it means professional or actual education, where a child is learning something, and whenever a philanthropic education like Kellogg or Ford, or a Government agency, has funds for education, they come forward posing as the logical ones to control the program.

Strong evidence indicates that great sums of money are wasted annually in this manner, since it is quite easy to publish bulletins giving glowing and convincing evidence of the great success of some workshop or summer institute. Thus the professional educators are almost entirely in control of the machinery of American education. That is the original machinery, the organization chart which starts with the United States Commissioner of Education, descends through the United States Department of Education to the State departments of education, then to the college departments of education, and from them to the school superintendents and the principals of the specific schools in the counties.

It is this organization, staffed by the very people who are largely responsible for the present plight of our schools, which now stands ready to receive and disburse a billion dollars or more.

Then there is a question. Would we entrust the discredited manager of an insolvent company with large additional sums to build new buildings and reorganize the concern?

If the General Electric branch at Louisville, the giant plant they have there, went insolvent, would we take the same managers that were in control when it got in bad shape and give them a lot of money to rebuild it and start it over, or would we change managers?

The Folsom memorandum submitted to President Eisenhower on December 31, 1957, indicates how the complete control of any funds allocated will, if not otherwise specified, "flow through the Commissioner and the men mentioned above," with provisions made for countless jobs for testers, counselors, and administrators. Everyone of them presumably are the same professional educator type as those who have been largely responsible for the present condition of our schools.

Then we came to this question which caused me a great deal of concern: What factual evidence could I bring and present to you gentlemen about this matter? What factual tangible evidence is available relative to this problem?

Well, that is difficult. I have here six pages cut from a college catalog. It is a university catalog and these six pages give the courses in the college of education. It is not proper, I think, for me to name the university, and I have marked out the name of the university

here, and I shall not name the men, of course, whose names appear in this program. Probably that is a courteous and proper thing to do.

Mr. GWINN. This is a teachers college?

Mr. BLACK. No, sir. This is a college of education in a university. It is a pretty good university. All right. To answer this question, six pages listing courses in the college of education have been cut from a university catalog and enclosed with this memorandum. The courses are probably typical for such colleges.

Now, that is a question which would have to be settled. This is the first one I picked up. I did not study a dozen or a hundred. There is no desire to point up the particular university in which this college is located since the other parts of the university seems to be doing a good job.

The proliferation of courses in the college of education is surprising, to say the least. There are 6 pages listing a total of 157, separately numbered and separately titled, but under the numbers and the items there will be 10 subdivisions on 1, each giving 3 credit hours. There are 15 subdivisions under 1 main title, "Modern Educational Problems," each giving 3 hours.

One of these 15 subdivisions gives 3 semester hours of credit, a total of 45 hours, approximately one-third of the number of semester hours required for a bachelor of science degree. It is 1 head with 15 subdivisions and in that 1 heading with the 15 subdivisions there is one-third of a whole college curriculum.

Mr. GWINN. To clarify that a little, those subjects on which they propose to issue a degree to teachers for work done have to do with techniques or methodology in education or so-called problems in education, and not one of them is a higher course or better course in mathematics or in the techniques of teaching better science or biology or chemistry or subjects of that sort. It all has to do with methodology, does it?

Mr. BLACK. I will read what they say:

175M to Z.

The number of the course is 175, and the subdivisions are M to Z.

Modern educational problems, 3 hours each. A brief survey of some of the problems in modern education. Subject titles for each course follow.

Now, 175M is modern educational problems, general elementary curriculum;

175N, modern educational problems, general secondary curriculum;

175O, modern educational problems, general curriculum;

175P, modern educational problems, general language arts problems;

175Q, modern educational problems, art education;

175R, modern educational problems, reading problems;

175S, modern educational problems, moral and spiritual values in education;

175T, modern educational problems, guidance;

175U, modern educational problems, general social studies problems;

175V, modern educational problems, vocational education;

175W, modern educational problems, testing program development;

175X, modern educational problems, general development of school philosophy;

175Y, modern educational problems, unclassified.

I do not know what that means. I laughingly said maybe they ran out of names there.

175Z, modern educational problems, is marked "Unclassified." I do not know what the philosophy back of that "Unclassified" is.

That answers your question.

Mr. ELLIOTT. Dr. Black, at that point you do not mean to leave the impression with this committee, I trust, that a student could take those 10 or 12 courses that you mentioned and obtain credit for a degree for all those courses?

Mr. BLACK. I do not know, sir.

Mr. Chairman, I do not know what they would do there. I do not know just how it would work. It would seem logical from the items that if the subject matter was given, for instance, in guidance on one, and then moral and spiritual values in education, it would seem that he could take both there, I would think.

For instance, in the curriculum, I do not know whether they would permit a person to take all three of those or not. I do not know about that, sir.

Mr. ELLIOTT. In other words, you listed 12 courses there.

Mr. BLACK. There are 13 listed and 2 unclassified, 15 in all.

Mr. ELLIOTT. I do not believe that any college would give credit for all 15 of those courses for any kind of degree.

Mr. BLACK. Possibly not. It would probably be fair to assume that they would not give credit at least certainly in all 3 or 4 of those curriculum courses.

Mr. GWINN. Let us see what point you want to make about that. Will you tell us a little more about why you think that is heavy on that side?

Mr. BLACK. Well, I have talked to a number of people and many people say, "Three 3-hour courses in education and you have about had it. You have about had what essential material you will cover if you take 3 courses, 3 hours each."

Now, that statement can be attacked and I am not in a position to defend it. All I am telling you is what people have told me who have taken the courses.

One very fine person told me that she had 45 semester hours in the field of education, and her phrase was, "I would not turn on my heel for more than 9 hours of it."

Now, I think perhaps you gentlemen should draw such conclusions as you can. It may be a little improper for me to draw conclusions from this. I have my conclusions, but I have to watch my conclusions to keep them from being prejudiced.

In that regard, I have checked this with other people, with two men in the field of the social sciences, and I think very able men, and another physicist in another university, and with an engineer who works in the area in a pretty high job, and another physicist in this area, and the whole thread of thought is that these are just courses piled on top of courses, just courses on top of courses.

Mr. GWINN. Suppose this committee approves legislation to send teachers to that school in the summertime to become better teachers of mathematics and biology and physics and chemistry and engineering, will they get any of that subject matter in that college?

Mr. BLACK. I do not know that I can answer that.

Mr. GWINN. Does that catalog offer such courses?

Mr. BLACK. Yes, this catalog offers mathematics and physics and chemistry and it takes a man to stand up under those. They are almost unmercifully hard and difficult subjects, and they really have a program in those fields if the student comes there and takes those programs, but more and more the people avoid any such things as that.

Mr. GWINN. They do not take the hard courses. Maybe you call those the soft courses.

Mr. BLACK. These courses are thought of, as I understand it, by most people to be soft courses. Here are some statistics on the grades given in a certain college which I will not mention, and thousands of semester hours are given in courses where no failures and no conditions are given.

Mr. GWINN. They all pass those courses?

Mr. BLACK. They all pass.

Mr. GWINN. It is an easy way to get a degree?

Mr. BLACK. Very easy. The proliferation of courses in colleges of education is surprising to say the least.

You will note that the 6 pages list a total of 157 separately numbered and separately lettered courses under one main title, Modern Educational Problems. Each one of these subdivisions gives 3 semester hours credit. The figure 157 mentioned above does not include 54 courses in psychology given in the college of arts and sciences.

Now, some of those psychology courses are pretty good, and we need to learn more about the human being and our own mind. But there are 54 courses in the arts and sciences. They have some courses in educational psychology in the college of education.

Some people maintain that the essentials of what is taught in departments of education can be covered in 3 courses of 3-semester hours each. Many also believe that the text used 3 hours a week for 7 weeks in some of these courses could be essentially covered by a reasonably intelligent person reading the book during 1 weekend.

Students report that in many courses the textbook is disregarded anyway and we hear of courses in which no text at all is used. No text at all is used in many of those courses.

For comparison purposes, the total number of separately titled courses in mathematics, physics, and chemistry combined in the same catalog in the same university is 172, and none of their titles have anything like 15 subdivisions. The education courses are grouped in divisions and certain professors are given titles of chairman of divisions, with additional prestige and salary.

There are 18 courses in the division of administration, 28 in the division of foundations of education, 63 in the division of instruction, and 49 in the division of vocational education.

I think a lot of Government money flows through that, too. The tendency of these people to like impressive titles is significant: Chairmanships of divisions, heads of departments, and so forth. That is all right provided it was a part of the academic world in such subjects as history and government, but it is not, and, since it is practiced over in the college of education, you get an undue amount of prestige and money and so forth for somebody over there compared with a professor of history over in the other college.

Mr. GWINN. Mr. Black, would you be good enough to read those subdivisions under administration. There are 15 subdivisions.

Mr. ELLIOTT. Let me interrupt to say that our general agreement is that Dr. Black has 16 more minutes, and I just want to call that to the attention of the gentleman.

Mr. GWINN. I have been taking too much time. I realize that.

Mr. ELLIOTT. I will say to the gentleman from New York that I am not being critical about his use of time, but I did want him to understand that our time is limited.

Mr. BLACK. Maybe I can finish this letter very easily and read these for you.

Mr. GWINN. The point I wanted to make is that a teacher does not become a better teacher taking 15 courses or any substantial number of courses in administration.

I have heard the criticism that we teach our teachers at these colleges to become good housekeepers and good janitors, but not good teachers of history. Those courses on administration might indicate that.

Mr. BLACK. The courses on administration are as follows:

101, school organization;

198, the administration of pupil personnel;

202, local school administration;

203, constitutional and legal basis of public-school administration;

207, school buildings and equipment;

209, A and B, 3 hours each, internship in educational administration.

Now, the thing that provokes some of us subject-matter people is the copying of things in the medical world like internship, workshops and and all sort of titles of that type which could be justified or not, depending on how you looke at it.

210, A and B, independent work in school administration, 3 hours each;

213, State school supervision;

221, A and B, seminar in administration;

229B, elementary principal;

229, business administration and finance of public education;

232, high-school administration;

233, the administration of the teaching personnel. I thought we covered that awhile ago.

198 is the administration of pupil personnel, and this is the administration of the teaching personnel.

238, trends in higher education;

276, administrative problems in today's education;

290, A and B, technique and professional work of the registrar, 3 hours each;

301, A and B, research problems in educational administration, 3 hours each;

321, A and B, research problems in higher education, 3 hours each.

I am not in position to criticize adversely or conversely. That is what they have listed in that field.

The tendency of the people to like impressive titles is significant, considering that many real scholars are quite modest. The following, copied from page 343 of the catalog mentioned, from which these

6 pages were cut, illustrates these titles, and I will leave the gentleman's name off:

M. A. in education, Ph. D., professor of agricultural education, chairman of the division of vocational education, head of the department of agricultural education.

Well, that may be good or it may be bad. It depends on how the other people in the university entitle themselves.

In this department of agricultural education, there are four 3-hour courses entitled "Problems of Agricultural Education." There are four more titled "Modern Problems in Agricultural Education," and one "Advanced Problems in Agricultural Education."

You may take that as repetitive or not. I do not know what they teach. I am reading what is in the catalog.

On page 308 are listed the elementary curriculum. General elementary curriculum, general secondary curriclum, and general curriculum.

At page 307 one finds problems of curriculum construction followed by problems of curriculum making. What would be the difference between curriculum construction and curriculum making?

Surely some measure of restraint should be used in listing courses. There are 60 semester hours in this 1 college dealing with the curriculum alone. In fact, that is almost half a bachelor's degree; 128 hours is the national standard. In fact, there are so many courses in the curriculum that a complete division of the curriculum has just been formed and the attached clipping from a paper, January 25, shows a picture of the professor who has just been elevated to the newly created position, chairman of the division of curriculum.

One is inclined to ask how many hard-working subject-matter professors on the university faculty in the departments where courses are not so proliferated are much more deserving of additional prestige and salary than is a professor in a department where curriculum construction and curriculum making are given 3 hours' credit.

The results of the policies in use in many of our schools can be seen in most any college class, especially in mathematics, physics, and chemistry.

Last September, 58 people enrolled in my freshman physics course. Before the 5-week deadline for dropping without an unsatisfactory grade, 28 percent had dropped the course. Although I tried with all sincerity and kindness to teach them, they were quite unable to come to grips with problems and laboratory exercises and deal with abstract ideas.

One had a strong impression that they had never had to face up to anything definite and specific before. Although they seemed to try fairly hard and respect me, while I certainly respected and sympathized with them, several others dropped out before the end of the term.

What I am saying in a clumsy way is that I did not get up and belabor the people as is done in some science courses because I tried to draw them out, but it was like pulling hen's teeth. They are fine young people. There is nothing wrong. You may think Kentucky is backward in the Nation, but there are some fine minds that come from Kentucky from the "head of the hollow" as the people say back in the hills.

I have had some of the best minds I have ever dealt with. Day after day college teachers face fine young American citizens who seem to have been robbed of their birthright. Most of them are unable to handle simple mathematics.

Now, there are only 22 taking the second half of the physics course, although a few of the 36 who dropped out at the end of the semester did so for reasons other than lack of ability. There were a few that legitimately dropped out because they had to take other courses and did not have to take more than the 5 hours.

Another example revealing one reason for the shortage of scientists and engineers was given by another class of 30 young men called preengineers. I had them. I was an adviser. After a few weeks, basic weaknesses in their scholastic background showed up. I was convinced that not more than perhaps 6 of them could become engineers without a great deal of remedial work missed in schooling. Twenty were reported as doing unsatisfactory work in 1 to 5 subjects.

Talk about a shortage of engineers. Here is a shortage of 20 or more in one room containing 30 young men who would like to be engineers, and signed up to take preengineering. You have a shortage of 20 out of the 30 right there, but who have been deprived of the right to get ahead.

Returning to the multiplication courses and jobs for professional editors, such proliferation is, of course, probably of minor importance when compared to the ideological effect of this proliferation on the thousands of teachers who study in those courses.

Again and again the college students express their displeasure about this. Many are driven completely away from the teaching profession because of these courses, and especially many prospective teachers of science are thus driven out.

A bright young man dropped into my office 2 weeks ago. During the conversation he said he had a major in chemistry and some years ago he planned to get a master's degree and teach science. While taking the educational courses required for him to teach science, he got disgusted with their content, gave up the idea of teaching, and left in the middle of a semester.

Over and over one hears stories like this. Although a volume could be written, we must close, and close with an important modification of the original question: Will the same group who are largely responsible for the present condition of our schools be given a billion dollars or more with which to continue their same theories? If this is done, the Nation may be a second-class power within 10 years, if it is not already.

I do not think it is already, but I shudder for the future.

Here is an alternative constructive suggestion, I hope, and it is not too well thought out because I did not have time to think it out as well as I would like. As an alternative, suppose that each of 12 learned societies in history and government and physics and mathematics broadly representative of American education selects from its membership 3 outstanding scholars. From the 36 people so selected, President Eisenhower, perhaps with the advice of such men as Dr. Killian, Dr. Allen Waterman, and Dr. Milton Eisenhower, such people as that, appoints a committee of 12, 1 from each society. This committee broadly representative of many fields of learning would have control over the policies of our schools.

Now that is unfortunate phraseology. They would have at least something to say, whereas now they have very little to say. That committee would have something to say about the policies of our schools, a committee broadly representative of the learned societies of the country who are interested in the children knowing some subject matter.

At present only a small segment of the school world, and that perhaps the weakest in the standpoint of academic competence, is in control. All the programs of education would have to clear with this committee of scholars rather than clear with the Commissioner of Education, as is proposed in the bills now pending.

Now this is not criticism of any Democrat or Republican bill, but in the bills pending, you find such phrases as:

The Commissioner shall from time to time determine.

Really, this means that the small group of professional educators who visit the Commissioner are the ones who determine. They are the ones who determine. The school world has very little to say about it.

Judging from past performances, they will determine to pyramid courses and programs and jobs for themselves, as is quite evident from the Folsom memorandum and from the proliferation of courses in the catalog mentioned above.

I might say that with the utmost humility and no sense of repartee to the gentleman who preceded me in proposing the bill, that the emphasis, as you gentlemen asked questions about that bill, was on the sciences, but riding back of it were 50,000 scholarships in education. The 20,000 in science were the ones that were coming to the attention of this committee, but riding back here are 50,000 in education.

As I understood it, he said 50,000 in education, 20,000 in science.

Mr. ELLIOTT. I will say to the gentleman that the bill that I have proposed provides that priority be given to students who seek scholarships in the sciences and engineering and mathematics and modern foreign language and the teaching of those subjects.

According to our time schedule, we have 3 minutes.

The gentleman from Kentucky, Mr. Perkins.

Mr. PERKINS. I think Dr. Black, who is one of Kentucky's outstanding professors at the Eastern Kentucky State Teachers College, a teacher of physics, has offered important suggestions to the committee. I think those suggestions will be helpful to the committee.

I do not want to take any further time of the committee inasmuch as there are several other scheduled witnesses today.

I am confident that the members appreciate your presence, Dr. Black.

Mr. GWINN. Mr. Black, you have 2 minutes left. I am just wondering what is your title.

Mr. BLACK. I am head of the department of physics in the Eastern Kentucky State College at the present.

Mr. GWINN. That is a teachers' college?

Mr. BLACK. Well, it was, and the title has been changed.

Mr. GWINN. That is what occurred to me as you were testifying. How are you getting by this hierarchy of educationists, this monopoly

of that group? If they are as powerful as we hear they are, your head may be cut off in Kentucky.

Mr. BLACK. Yes, sir; that is right.

Mr. WAINWRIGHT. It will take a few days for the testimony to be printed.

Mr. BLACK. It might take a few days.

Mr. GWINN. I think we are greatly indebted to you for your courage and for your approach to this subject.

Mr. BLACK. I asked for leave to come up. I am not talking about my own institution. I am talking about a selected university. The sins of our own institution and my own department are another thing. I did not bring those in. It is another institution. It is not exactly an abstraction. It certainly is objective. I am not belaboring our own institution.

Mr. GWINN. There are enough boys coming through to get the scholarships. The point you make is that maybe two-thirds of them are being lost. They will never have a chance to compete for the scholarships. That is where our national danger is and that is where the problem lies that this committee should attack. Is that it?

Mr. BLACK. That is largely it. By the seventh and eighth grade, when you start testing and counseling, it is my understanding that there is such a lack of background in fundamental subjects that I do not know what you would be testing or in what you would be counseling. If we had some substantial solid subject matter coming through the grades then at seventh and eighth grade, the child might have something to test and something to counsel.

One of these bills provides 20 jobs in the 16, 17, and 18 category, and I have a friend, a Phi Beta Kappa, head of the research department of a big laboratory near here, and his rank is a 15.

You will have in 1 of the bills 10 superjobs in the 16, 17, and 18 classification, and the head of the research department of 1 of the biggest laboratories in this whole country is a 15.

Mr. ELLIOTT. He is a Phi Beta Kappa?

Mr. BLACK. Yes.

Mr. ELLIOTT. Thank you very much, Dr. Black.

Mr. BLACK. I thank you very much, and I hope my presentation has been worthwhile.

Mr. ELLIOTT. The committee deeply appreciates the information you have brought to it.

Our next witness will be presented by the gentlewoman from Oregon, Mrs. Green.

Mrs. GREEN. Mr. Chairman, I certainly am not going to take any time in giving a long introduction. I could do that. I think our next witness has some material which is very valuable to offer to the committee. He has come here at my special request, Dr. Philip Coombs, who is with the Ford Foundation and is the secretary and director of research of the Fund for the Advancement of Education.

Leaving that very brief introduction, I think that I will turn the time over to him, if it meets the chairman's approval.

Mr. ELLIOTT. Thank you very much, Mrs. Green.

May I say to you, Dr. Coombs, that the committee is happy to have you. You may proceed in any manner that you desire.

STATEMENT OF PHILIP COOMBS, DIRECTOR AND SECRETARY, FUND FOR THE ADVANCEMENT OF EDUCATION, FORD FOUNDATION

Mr. COOMBS. Mr. Chairman, I am pleased to have been invited to express a few ideas before your committee.

I should say at the outset that I am here as an individual speaking my own mind, because neither the Ford Foundation nor the Fund for the Advancement of Education has any position whatever on the issues at stake before your committee. We can get up a good argument within our own staff on some of these issues, and I know definitely that some of my colleagues would not agree with some of the views that I may express here.

We have, however, as an organization, been very active in the last half dozen years trying to help wherever we could at all levels of education, in both private and public institutions, to advance the quality of education and to broaden the opportunities for young people to get a good education.

I will confine my remarks to the question of scholarships, especially at the undergraduate level, and to the question of loans, although I would be happy to try to take up any other item that you may wish to raise.

My own background is that of an economist, not a professional educator. I have worked in the Government at the State and Federal level. I have taught economics in two different colleges, and I have been engaged in education for the last half dozen years with the Fund for the Advancement of Education and the Ford Foundation. Because of my background I am inclined to look at some of these problems from the point of view of an economist rather than a professional educator. I am still a novice as far as education itself is concerned.

Specifically, I would like to comment on two matters: First, the relationship of scholarships and loans to the whole economic pattern of higher education; and second, the principles which, in my own private judgment, would be useful guides to any Federal scholarship or loan program.

I would be happy to be interrupted anywhere along the way.

To save your time, I have tried to reduce my comments to a series of fairly succinct propositions.

At the outset, let me declare my own personal conviction. All things considered, I believe that the Federal Government can very usefully expand its role in relation to education in the years immediately ahead, in the interest, first, of broadening educational opportunities for all young people and, second, of popularizing education and raising the values we attach to it as a Nation. The latter does not necessarily cost large amounts of money. By honoring excellence of performance in education and by honoring quality in education the Federal Government can do much to help expand the Nation's total supply of talent—well-developed talent for all uses, not merely scientists and engineers. This is vital because a major key to our Nation's future development and progress, whether in relation to peace or to defense, is our supply of well-educated manpower. Our natural resources are not likely to be our major bottleneck; our main limiting factor will be brainpower. Therefore, as a Nation we must help every young person develop his potential to the full, whatever his potential is.

I believe the Federal Government can do more than it is now doing to assist in this direction without in any sense taking over control of education. We are all going to have to learn a good deal more than we now know about how the Federal Government can best play this larger role. Thus, perhaps we would do well to view the next few years as a period of learning and experimentation.

With respect to the relationship of scholarships and loans to the whole economic picture in higher education, I would make the following propositions, which I realize are in some respects debatable.

First, higher education in the United States today is seriously threatened by an erosion of quality. This erosion is already taking place, due in no small measure to inadequate economic resources and to the inefficient use of those resources. The decline of educational quality, which we can ill afford at this point in history, can only be averted if our colleges and universities are better financed, if they succeed in getting a larger share of the Nation's finest manpower for teaching, and if they make the most efficient use of that manpower and other resources.

This proposition, I think, is true irrespective of how many young people go to college and irrespective of whether or not there are scholarship and loan programs, though obviously the more rapid the rise in enrollments, the more serious becomes the problem of colleges in maintaining and improving the quality of education.

A second proposition is that increased financial assistance to students to enable them to get to college does not mean increased financial assistance to the institutions they attend. Indeed, it could even mean a worsening of the economic problems of those institutions.

Congress, I believe, would make a grave mistake if it passed a scholarship and loan program and assumed that it had thereby done its duty by higher education. The problem is not merely how to get the ablest young people to college, but how to insure them a good education when they get there. The latter will depend heavily on how successful the colleges are in securing an adequate supply of top-quality manpower for teaching, and in utilizing that manpower most productively.

In short a good case, I believe, could be made for Federal scholarships and loans, but taken by themselves such programs would not get at the most crucial problem facing American education—the problem of how to expand enrollments and quality simultaneously. This dual task represents the greatest challenge American education has ever faced. We must not only help able students to have access to education, but we must help the colleges provide a good education.

Mr. ROOSEVELT. Mr. Chairman, could I ask a question at that point?

Mr. ELLIOTT. The gentleman from California.

Mr. ROOSEVELT. Are you suggesting that this personnel is available, but today is not being channeled into teaching; in other words, that more attractive offers are taking it elsewhere than the universities and colleges?

Mr. COOMBS. Mr. Roosevelt, it seems to me that there are two factors here. The first and most basic is that our economy, our society as a whole, is up against an overall shortage of high ability manpower, not only in science and engineering, but in other fields as well. This is not because we have a smaller supply than we used to have but,

rather, because the dynamic growth of our economy has created a much greater demand than ever.

The second factor is that teaching is at an increasing competitive disadvantage in bidding for its share of this limited supply of well-educated manpower. We have allowed economic rewards for teaching to deteriorate in relation to the rewards for other occupations. We have allowed the prestige of teaching, apart from the economic rewards, to deteriorate relative to other fields demanding the same quality of manpower.

To correct the situation, it seems to me, we must move in two directions. First, we must do everything we can to expand the overall supply of highly trained manpower. This we can only do through strengthening education, and it is a slow process. We cannot perform miracles in a year or two, but we must start promptly toward this long-run goal.

Secondly, we must put teaching in a stronger competitive position, partly by raising salaries substantially, but also by utilizing good teachers as effectively as we can, thereby making the supply go further. We must make teaching much more attractive, not merely in financial rewards but in the challenge of the work itself, so that our ablest young people will enter the field in large numbers.

Mr. WAINWRIGHT. Mr. Roosevelt, would you yield?

Mr. ROOSEVELT. Yes.

Mr. WAINWRIGHT. You are setting forth the ideal quite correctly, but, at the same time, the statement that you made before that prompted Mr. Roosevelt's question presents the barrier to accomplishing the ideal.

Both bills, Mr. Elliott's bill or any of the Members' bills, are desirable objectives, but you put your finger on the great weakness. That is that here you have a great flow of scholars going into a university, and the university itself says, "We cannot take them because we do not have either the money or the qualified teachers to carry out the objective of this type of legislation." You put your finger on it.

How would you address yourself to correcting that situation?

Mr. COOMBS. If I understand your question, sir, you are saying that these bills tend to expand the flow of students, but do not compensate by strengthening the institutions to handle this larger flow.

Mr. WAINWRIGHT. We are both saying the same thing. Is that not the point you yourself are making?

Mr. COOMBS. I think the solution is not to keep the able students out of college and keep the traffic down because this obviously does not get at the objective of expanding our total supply of well-educated manpower.

The solution, it seems to me, lies in the direction of getting the young people to college who can benefit most from it, and at the same time doing appropriate things to enable the institutions to provide a good education to these young people.

Let me add a footnote.

Selecting very promising young people and helping them get to college does not necessarily mean that you increase the total number of college students by the number who receive scholarships. Many institutions have selective admissions standards. What a competitive scholarship program might do, what is already happening in many

places, is simply to upgrade the average quality of the students who attend college. I would hope we do not have to put any ceiling on the number of students who can go to college, but I think that we can improve the quality of ability and preparation of students entering college.

Mr. WAINWRIGHT. But in light of the facts, you are going to have to put a ceiling on the number of students that the universities themselves are not physically qualified to take. Those universities that have the largest demand from the student body at the present time are not capable of accommodating them. They can only accommodate 1 out of 7 or 1 out of 8.

How would you remedy that so that the better type of student will not be reduced to 1 out of 7 or 1 out of 8, as it stands at the present time?

Mr. COOMBS. It seems to me that what we need in this country is a larger number of eminent institutions. We do not solve this problem simply by expanding those that are now regarded as eminent. They were not always eminent; they became that way over a period of time. We have a considerable number of institutions which are on their way to becoming eminent and I think we need to help them accelerate this trend. At the same time we must help our best institutions expand their capacity to handle larger numbers of students; though, incidentally, I think many of them could handle larger numbers right now if they made more efficient use of the facilities and faculties they already have.

It will not suffice merely to give them more buildings. It is what goes on inside those buildings that is most crucial. This is essentially a problem of getting an adequate supply of well-qualified teachers and using them efficiently.

I do not have any panacea, especially one which Congress could act upon, that is suddenly going to give the colleges and schools a much better supply of teachers. But I think that if Congress would acknowledge in some appropriate way that this is the core of the problem, the quality problem, that this would encourage local governments, State governments, and private parties to attack this problem as a priority goal in all the things they do.

Mr. WAINWRIGHT. Congress, on the other hand, is looking for this panacea. I do not know where we will ever find it. I did not mean to interrupt your train of thought.

Mr. COOMBS. To proceed with these brief propositions, my third one is that a large scale scholarship and loan program would place colleges in a better position to raise tuitions to a level closer to actual costs without prejudicing the educational opportunities of students, but whether this would help the financial position of the colleges in the long run would depend on how wisely they used their available resources.

Basically, a scholarship and loan program is not the means for improving the financial position of the institutions. A scholarship and loan program must be justified largely on the ground of expanding individual opportunity of students; not on the ground of helping the colleges with their financial problem.

Mr. ELLIOTT. Let me ask the gentleman a question there.

Does the gentleman feel that a scholarship program of modest proportions such as we are speaking of here, and certainly against the background of the number of high schools in America it is very modest, even taking the largest figures, that that program will put any undue additional burden on the colleges that participate in it?

Mr. COOMBS. Well, as I understand, we are talking about anywhere from 10,000 to 40,000 a year.

Mr. ELLIOTT. That is right.

Mr. COOMBS. That is a very small fraction of the number entering college in a year, so that I would not regard this program in and of itself as putting a greatly increased burden on the colleges. After all, they can, if they choose, select the students they admit and limit the number to their available capacity.

Mr. ELLIOTT. Is the point that the gentleman is making that there is a considerable need for additional facilities in the colleges, irrespective of any scholarship program that we may enact?

Mr. COOMBS. Yes, sir. I want to make it clear in expressing my own opinion in favor of an appropriate type of scholarship and loan program that this only helps on one side of the academic equation—the student side. It does not help on the institutional side and it could conceivably complicate the financial problems of colleges.

Mr. GWINN. Mr. Chairman.

Mr. ELLIOTT. The gentleman from New York.

Mr. GWINN. I was inclined for a while to support the idea of the scholarship on the theory that it would stimulate better work in the high schools if one boy in each high school was going to get a scholarship, and they might teach better mathematics and science to all the boys, and thus elevate the quality of work being done at that level. But many of the witnesses say that the smart boys will run away with those scholarships like that anyway, and it will not essentially change the present order of things about which the earlier witness complained. What do you have to say on that?

Mr. COOMBS. Mr. Gwinn, this is obviously a matter of speculation and private opinion. I do not know any scientific way to get the answer to the question. In my own judgment, recognition by the Federal Government that high academic performance by young people is something to be commended by their country would have the effect of altering the attitudes of many young people in the high school toward studies.

I would say that one of the main reasons why many students in high school do not perform up to their potential academically is not because the teachers are poor, although we certainly have too many who are, but because the basic attitude in the student culture is not conducive to high academic performance. In other words, young people are highly responsive to the accolades which their own peers give them, and, if it is not popular among young people to study hard, to perform well, to get good grades, this is a great deterrent to the intellectual development of the young people.

It seems to me that anything the Federal Government can do to attach national value and social prestige to intellectual achievement will improve the atmosphere of the high schools and the motivation of students. I have the impression that the present national merit scholarship program has already tended to work in this direction and

to make it more popular among young people to strive for good academic achievement.

Mrs. GREEN. Would the gentleman yield?

Mr. GWINN. Yes; I yield.

Mrs. GREEN. Would you say that it is equally important not only in the student culture, but in the adult pattern, for a greater recognition of intellectual achievement; that this has been as responsible as anything for the lack of teachers and for the erosion which you spoke of in our educational program?

Mr. COOMBS. I certainly agree.

Mrs. GREEN. It is a disregard for the egghead.

May I make a remark off the record?

Mr. ELLIOTT. Yes.

(Discussion off the record.)

Mr. ELLIOTT. Back on the record.

Mrs. GREEN. I was going to expand what Mr. Udall said, that not only if we duplicate the newspaper space given to athletic achievement, but if the time would come when we pay the head of the science department in a university as much as we pay the head of the athletic department or the coach, I think it would be a great day, or if we awarded as many scholarships on the basis of scientific achievement as on the athletic ability.

Mr. WAINWRIGHT. I think the thinking has to start here and we cannot criticize the universities too much for that when we as representatives of the people have essentially the same philosophy.

Mr. COOMBS. I hesitate to step into this family discussion about athletics except to observe that it seems to me that we do not have to choose between athletics and intellectual performance. Indeed, we may have some useful things to learn from our experience in athletics. This is one area in which excellence is honored by young people generally and in which many strive for excellence of performance.

The Greeks had a remarkably good culture in their heyday and they managed somehow to honor excellence in both intellectual and physical performance. I do not see why we cannot be a well-rounded culture which honors excellence of performance in all realms.

One of the great things that competitive athletics does for many young people, it seems to me, is to give them a sense of high standards in gaging their own performance which could well carry over into the academic area. We might learn some lessons from the athletic realm which we could apply to the intellectual realm.

Mr. ROOSEVELT. Is it not true, in contravention of my good friend from New York, Mr. Wainwright, that it does not start at the top, that it could perhaps better start at the bottom, beginning at the school level on up to the university level?

I went to a small school in Massachusetts where the top 10, equivalent of a dean's list, I suppose, got very special privileges and, believe me, it was quite a thing and quite well recognized in the school. It seems to me that you start there and not, with all due deference, in the Congress. I think the Congress will reflect what comes from the bottom rather than going in the other direction.

Mr. COOMBS. May I proceed to my next proposition, Mr. Chairman?

Mr. ELLIOTT. Proceed.

Mr. COOMBS. I come now to the question of the relationship of scholarships to loans, because it strikes me that this is a question of some difficulty.

Mr. ELLIOTT. Before the gentleman gets to loans, did you indicate any view with respect to whether or not scholarships should be based on need?

Mr. COOMBS. I am coming to that, sir.

Mr. ELLIOTT. Proceed.

Mr. COOMBS. A loan program in my view is a supplement to a scholarship program, but not a substitute for a scholarship program. Each has its own role to play.

A true scholarship program is highly selective on the basis of demonstrated ability and promise. It is more refined and discriminating in its application and more certain of results in individual cases.

A loan program is less selective, less discriminating, less refined in its application, much broader in the number of young people affected, and less certain of outstanding results in any individual case, but quite certain of outstanding results in the group as a whole.

Somewhat different principles, I think, should guide a scholarship program than a loan program, though the principles should be supplementary and not contradictory.

May I suggest, again from a personal point of view, some principles which might usefully guide any type of Federal scholarship program?

The basic aims of a Federal scholarship program at this point in history, it seems to me, should be first to identify the intellectually ablest and most promising young people and afford them not only strong encouragement to go to college, but the opportunity to select institutions best suited to the development of their particular abilities. I would like to stress this.

It is not merely a question of whether a student goes beyond high school, but in our highly and properly diversified system of higher education, it is important for each individual student to get to that institution which for him is most appropriate. This takes a good deal of guidance, which frequently is missing today. A scholarship program may not add greatly to the number of able young people going beyond high school, though I think it will add significantly; but, more importantly, it will broaden their freedom of choice as to where they go for their higher education. Such freedom of choice is in the interest of the individual and of expanding the Nation's total supply of well-developed, high-ability manpower for all purposes, including science and engineering, but not limited to that.

A second objective of a scholarship program at this time would be to place the prestige of the Federal Government behind the notion of high academic performance in high school, which is Mr. Gwinn's point, and the importance of high educational quality at all levels.

A third objective would be to encourage the development of better means by which laymen and professional educators alike may evaluate the adequacy and the performance of school systems and of colleges.

Let me illustrate how the Federal Government can provide leadership in attacking important educational problems. Until fairly recently it was not easy for either a layman or a professional educator in many communities to get up in public and talk about the need for

programs offering greater opportunity for abler students. This was regarded by many as undemocratic and psychologically unsound. Today you can go into most any community and you will find discussions going concerning the improvement of educational opportunities for able students.

I think this shift in attitude at the local level among both laymen and professional educators has been prompted in no small measure by the leadership of the Federal Government, by discussion at the national level of the importance of high ability people in all realms of our democracy. That it is this kind of influence which, it seems to me, national leadership can exercise on local communities to improve the whole situation.

To accomplish the foregoing aims of a scholarship program, the program should have, I believe, the following characteristics. (I do not address myself here to any particular bill before you because I do not know enough about them:)

First, it should be small enough to be highly selective but large enough to have a direct and substantial impact upon the aspirations and the performance of a large majority of local school systems and their students.

Second, it should utilize the most adequate and equitable means available for evaluating and selecting scholarship recipients.

Third, it should be neutral as to the student's choice of institution and as to the student's choice of major academic field. I realize this point runs counter to much of the current discussion, which focuses exclusively on science and engineering.

Fourth, it should avoid fortifying any existing rigidities in our existing educational system, both as to organization and practice, and it should avoid creating any new rigidities.

I will come back to this point, which is one that has not been discussed very much, to my knowledge, but which I think is quite important.

Now, to be neutral as to the student's selection of institution, the scholarship award must be related to the actual cost of attending the particular institution selected. Otherwise, it is not neutral. To ignore this important consideration in determining need would be illogical and misleading and would be inequitable to the students and to various institutions.

Finally, to avoid fortifying undesirable rigidities already in our school system, eligibility for a scholarship should not be limited to those who have completed 12 years of school and should not exclude high school students who, while in high school, have engaged in some college level work.

May I elaborate this point just a little?

In my view we have come increasingly in this country to a rigid grade system in our schools, a kind of chronological lockstep under which all youngsters start school by law at the same chronological age, ready or not, and under which they proceed 1 grade a year, ready or not, until they finally all emerge with a diploma after 12 years of schooling, despite vast individual differences among these youngsters.

Now, I think we got into this system not because of any political or psychological or educational theory, though we have adorned and justified the system on those grounds. We got into it basically for

good sensible administrative reasons. The school administrator has a tremendous traffic management problem of moving little bodies around according to a clock, and the simplest way to manage the traffic problem is to group all children on only 1 criterion, which is chronological age, and to group them in fixed sized groups of 25 to 30 and put them in a self-contained classroom with 1 adult who thereafter performs every function that an adult has to perform.

Then we proceed to justify this simplest of all possible traffic arrangements on high grounds of educational psychological and political theory.

I think we need to break away from the rigidity of this chronological step to enable every student to move at his own best pace and to have that academic diet which for him is most nourishing. This obviously will differ widely among students of the same age.

We have had some good experiments in the last 5 years which demonstrate that many students should not spend 12 years going through school, that 11 years is quite adequate, for some even 10 years, and that to hold them back in this chronological lockstep system is to thwart the development of their ability. Thus, any Federal program should not prejudice the opportunity for the school systems to change, to become more flexible and to permit, as many colleges now do, a well-qualified and sufficiently mature student to go on to college whenever he is ready, whether he has finished 12 grades or not.

Another experiment has brought college-level work down into high schools which have teachers qualified to teach college courses. We must be sure that the student who is able enough and motivated enough to take college-level work while he is in the 11th or 12th grade is not penalized by some language in a statute setting up scholarship eligibility rules.

I think we need to lean over backward to give the school system every opportunity to develop a much higher degree of flexibility than it now has. We must not freeze this grade system either at the school or the college level, but let it take its own best course and keep any scholarship rules out of the way of such developing flexibility.

Finally, I have a few comments on principles which might guide a loan program, as distinct from a scholarship program.

A loan program should aim to improve educational opportunities for any young person, not simply the ablest, who desires to go beyond high school and who is capable of gaining admission to a qualified institution of higher learning. Eligibility for a loan, therefore, would be much broader than eligibility for a scholarship. The loan, it seems to me, should not be limited by the kinds of performance tests which a scholarship program would require. Nor should it be limited by a means test on the financial end.

The main advantage of a Federal loan program is the possible liberality of its terms in contrast to commercial loans, and the abundance of loan funds that could be made available in contrast to those now available through the colleges.

Consideration should be given to designating the colleges as the loaning agents for the Federal Government, but with repayments made directly to a Federal agency. I suggest this because a loan for a student in college is part of his financial pattern. The rest of that

pattern will include help from home, his own earnings, possibly a scholarship he gets from the college, plus a loan if he needs one.

The student needs a good deal of mature advice in working out his particular pattern of financing, and the college is in the best position to help him. Consideration might therefore be given to channeling any loan funds through the college, but making the student responsible to someone other than the college for its repayment.

One footnote: It strikes me that any provision for cancellation of a Federal student loan for those who happen to enter a particular occupation, including teaching, would be ill-advised. This may sound contrary to all the emphasis I placed earlier on making teaching more attractive, but it seems to me we have already done too much to create the impression that teaching somehow is an occupation which requires charity.

I believe that the way to make teaching more attractive is not to give teachers charity, but to give them decent salaries.

Finally, in addition to a possible loan program, I suggest that it might be well to consider what the Federal Government might do to encourage savings for college, because savings and loans are both ways of spreading the high cost of going to college over a longer period of income. If we are going to spread it beyond college, we might equally well spread it back to the precollege period.

Many families save now, of course, toward the future education of their children, but I suspect that with some ingenuity we could make savings for college even more attractive than it now is.

I have no specific recommendation to make except that this avenue also be explored along with loans.

That is the end of my comments, Mr. Chairman.

Mr. ELLIOTT. Thank you very much, Dr. Coombs.

I want to say that I have very definitely enjoyed your presentation, although I find myself not in complete agreement with the details of some of your recommendations.

Mrs. Green.

Mrs. GREEN. I have no questions, Mr. Chairman.

Mr. ELLIOTT. The gentleman from New York, Mr. Gwinn.

Mr. GWINN. Mr. Coombs, Dr. Edward Teller was a witness here yesterday and he made a very important point of the fact that he thought our higher education was in fair shape, that is, it was producing in the field where our need is most acute now. He mentioned the productive universities or colleges or institutes as Massachusetts, Case, Cal Tech, and some branch of the University of California which I take it is also a privately supported institution.

It occurred to me that if that is true in our higher education because the free elements in education have taken possession and have supported pure science and research, applied science, whereas there is not much evidence that even the best of our State universities have excelled too much in these fields, that maybe our public education has an inherent weakness in it; maybe, as you described, some of the step-by-step disciplinary management problems that may be inherent.

We have many compulsory features in it. We violate the free movement pretty well. You complain that we have a static condition there affecting both the abler and the less able boys and girls who

go through together, and maybe we ought to encourage much more the private approach to our lower education in the lower grade in order to bring out the better, the more capable material in our society.

Have you ever thought that there is something that may be an inherent difficulty in our public school system?

Mr. COOMBS. Well, Mr. Gwinn, my organization, as I indicated earlier, works with both public and private schools and colleges and universities. We draw no distinction in our own grants between them. I think it is fair to say that some of our best and some of our worst schools and colleges are private. Some of our best and some of our worst are public. It does not seem to me that there is anything necessarily inherent in either public or private education that guarantees the quality of one over the other. Both are confronted, all education is confronted, with profoundly important difficulties by the very nature of the process.

You will find, if you examine the students at some of the leading Ivy League colleges—colleges which currently take in roughly a 50–50 proportion of students from public high schools and from private preparatory schools, from the best of the private schools—that the performance record of the public high school students on the average is somewhat better than that of the private school students.

Now, there are many reasons for this difference that go way beyond the schools themselves. I would not concede that you cannot have a public school that is every bit as good in quality, and in some respects even better in terms of the students' own personal development, than a private school. We have such public schools. We just do not have enough of them. We have some public schools today which will compete on all fours with the best of the private preparatory schools.

I think we need both public and private schools and both kinds of colleges. They all have their role to play.

Mrs. GREEN. Would the gentleman yield for just one question?

Mr. GWINN. Yes, certainly.

Mrs. GREEN. It has been my observation that oftentimes the parents who send their youngsters to private schools lose their interest in the public schools, both taxwise and as far as the educational program that is offered.

Dr. Coombs, would you think that this might be a very dangerous trend if the Federal Government, and I do not know whether Mr. Gwinn had that in mind, put such great emphasis on the private schools and encouraged them to that extent that the general public would lose interest in improving the quality of the public schools, and also lose interest in adequately supporting them and that this, as far as our democratic process is concerned, would be a very sad state of affairs?

Mr. COOMBS. In some of our suburban "bedroom communities" where a fairly high proportion of young people from relatively high-income families go off to private school, sometimes to get a better education in the eyes of their parents and sometimes just to leave home and get out of the way of the parents, you do find, I think, that there is not the best kind of support for the local public schools. But where you find a community like your own, Mr. Gwinn, which I think some time back made up its own mind that its public schools were going to be as good as can be had in any kind of school, public

or private, and when you get the best leadership of the community behind the schools, you can get a performance there with young people just as good as the best of the private schools. I think if I am correct, you are from Bronxville; are you not?

Mr. GWINN. Yes; that is right.

Mr. COOMBS. I think the Bronxville school system is an eminently good example of a public school which, by any evaluation over a considerable period of time, stacks up very well against any private school.

Mr. GWINN. You have in your organization Dr. Stoddard who was the man we leaned on heavily to start us off right in Bronxville.

Mr. COOMBS. I think you had the wisdom when you decided to have the best possible public schools to get the best possible leadership without which you cannot have the best possible public schools.

Mr. GWINN. I had no thought in mind of neglecting the public schools and going over to private. My notion is that we do not have enough private schools to make it healthy for the public. Our college situation is healthy because the State universities have to compete with the private institutions. I suppose we are half and half.

Mr. COOMBS. We are below that on private now. We are rapidly declining.

Mr. GWINN. If we had a choice between private schools and public schools, we would get rid of this compulsory hierarchy in our public-school system that undoubtedly is doing damage, such as the impossibility of the board relieving itself of bad teachers because of tenure process and other processes by which our public-school system has congealed into a kind of a hierarchy of public-supported people, it seems to me.

I agree heartily with the preceding witness.

Mr. COOMBS. I do not share the rather popular image these days of a monolithic hierarchy running our public schools against our will and giving us bad results. I personally feel that professional educators as a whole, though they have their weaknesses as we all do, have done an astonishingly good job over the years, frequently under serious handicaps.

This country has performed a miracle in expanding educational opportunities to its youth that is not matched by any society in all history, and we have good administrators and poor ones. We have good school boards and poor ones. I think a community can have the kind of public education it wants if it wants it badly enough, badly enough to vote the taxes, badly enough to pick a good school board and good leadership and go out and pay for good teachers.

This is not theory. It is a fact, because it happens in a good many communities, but in not enough communities.

I do not think there is any monopolistic group holding down educational quality. On the whole, the educators are doing what they can to push it up. We need to help them push it up more. We need to get better leadership in larger amounts into public education. We need to awaken the American public to match our words with deeds in education. As a Nation we are schizophrenic about education. All through our history we have paid great homage to education, verbally, but when it starts hitting our pocketbook, we do not match with deeds the words we use in praise of education.

This is a point in history when it seems to me that a congressional committee such as this can really awaken the Nation to the kind of breakthrough we need in education, a breakthrough, as Walter Lippmann one wrote, that must be comparable to the breakthrough on the defense front which has occurred since Pearl Harbor. Our educational effort today, relative to our educational needs, is still on a pre-Pearl Harbor basis. And I speak not only of money, because money alone will not solve this problem. We need a breakthrough on many fronts in education, public and private, including a breakthrough of educational technology, if you will.

We need to harness new means of communication such as television to better learning. We need to harness the highest talents we have in this country in all the disciplines to the strengthening of education. I think we waste our time when we adopt a scapegoat theory of educational history and try to beat on the teachers colleges, try to beat on the professional educators, try to find some scapegoat to blame because we have suddenly discovered we are not as good as we ought to be in education.

Mr. GWINN. That is probably correct.

Do you find the local school boards taking more and more interest, or is the superintendent of schools largely the dominant factor in the setup of most of our school districts. I mean, are the school boards really functioning?

Mr. COOMBS. I again would hesitate to make any general statement because I have seen such a diversity of situations. I can find you places, and I am sure you know of places, where the relationship betwen the superintendent and the school board is one of partnership, where there is mutual respect, where the school board talks candidly about anything including curriculum on an even level with the superintendent, but where they respect his professional qualifications and accept his judgment unless they are very sure he is wrong. There are other cases where they hardly speak to each other, and this is, it seems to me, at least as much a reflection upon the school board as upon the superintendent if it allows itself to be run by the superintendent.

Mr. GWINN. We have these cases like Pasadena and others you know, where it seems as if the school board is, even in a community like Pasadena, unable to function. The politics of the thing is such that the superintendent of schools, with the help that he gets from outside, is in command. The city of New York might be another.

Mr. COOMBS. I have a hunch that where you find an unwholesome situation in the management of a school system, you find an unhealthy community. Some communities may well require psychiatric treatment rather than simply firing the school superintendent. There may be factors at work in the community itself that make it impossible for the school system to operate well.

Mr. GWINN. It would seem to me that if the school board is functioning, the principal responsibility in our system of elective society is that it should be in command. There should not be any difficulty in letting a teacher out or letting a school superintendent out, if that is necessary for the good of education, but that is a very difficult procedure today. We all know that.

Mr. COOMBS. It is very difficult for many businesses to fire an employee, or for the Government, or for private schools and colleges.

Mr. GWINN. Yes, and probably it is not for the good of business.

Mr. COOMBS. The problems of human relations are not unique to education, I think. We encounter them everywhere.

Mr. GWINN. When you destroy freedom of action of the individual, you have the worst thing to contend with, it seems to me, and as we have grown big, as we have in our public school system, we have become more rigid, as you say, and much less free in the exercise of responsibility than we have in the ordinary private operation.

After all, we are educating for freedom and it seems to me that the public school system is violating many of the elements of freedom that we should teach.

Mr. COOMBS. I think it is also doing much as a total system to create conditions of freedom in our society.

Mr. GWINN. I say you cannot make general statements because it seems to me that the tendency is there that, when you have compulsory attendance, you have compulsory going to school to a teacher who is frozen in her position, she has a class whether the class wants to go to her or not, and has her job whether the class wants to get rid of her or not, who has her compulsory pension and income, the community is not very free in its selection, certainly, of personnel.

Mr. COOMBS. I think these factors are frequently frustrating in particular situations, but I think we have demonstrated in many public school systems and public universities that within this framework of tenure and the like a great job can be done if there is the will and the leadership to do it. These factors need not utterly frustrate our drive toward better quality education by bringing out the best in the people who are on the job.

Mr. WAINWRIGHT. Mr. Chairman.

Mr. GWINN. I do not mean you will utterly frustrate. We are trying to find out why we have this weakness. We have a shortage. Our production is low on the whole. Our time required to receive an education is too high. We have too many repeaters. We fail to select and give the faster boy his pace. That is pretty nearly inherent, I am afraid.

Mr. COOMBS. May I say that in my view, when you speak of weaknesses, these are not weaknesses relative to former strengths we once had. I do not believe that the issue in American education is whether we are doing as good a job as we used to do. The evidence is quite clear that we are doing a substantially better job than we used to do.

Johnny really can read, I think, at least as well as and probably better than his father at the same age. His father has a bad memory oftentimes. The real issue is whether we are doing enough better, and here it is quite clear that we are not, because our needs for education in an increasingly complex world are multiplying by leaps and bounds. Thus, when we speak of weaknesses, they are relative to what we would like to be doing, what we need to be doing, what we need to get on to doing. They are not weaknesses relative to some great strength we formerly had and somehow lost. In absolute terms we are far stronger educationally today than ever before.

I think on the whole, American education has done a miraculous job over the years of getting better and better. It is threatened right now, because of this manpower factor in teaching, with the possibility of positive erosion at the very point in history when we

can least afford such a decline in quality. I suggest that nothing short of the most heroic efforts constituting a breakthrough in education as sweeping and as radical as the breakthroughs we have seen in science will assure that we can make quality go up rather than down.

But we start from a position of which we can be very proud, I think, as a Nation.

Mr. WAINWRIGHT. Mr. Chairman, I think that the committee should be indebted to Mrs. Green for, at least in my opinion, bringing the best witness we have had heretofore in these hearings. I might say my views are closer to what I have heard today, so maybe I am somewhat partisan in that, but I might also say that the gentleman has said that we in this committee can take the leadership.

I do not want to put words in his mouth, but that is in effect what he said. He said we have the challenge before us which is the very point I tried to make to Mr. Roosevelt earlier.

For a practical politician, this is not a good thing to say, but I think that in your statement and in your discussion you have covered on the philosophical level almost every conceivable question that we could put to you. It has been very stimulating.

Mr. COOMBS. I am honored by your comments, sir.

Mrs. GREEN. I appreciate the comments of the gentleman from New York, and am in complete agreement, and I am personally greatly indebted to you, Dr. Coombs, for taking the time out of your extremely busy schedule to spend with us. I think we as members of the committee have benefited.

Mr. ELLIOTT. I wish it were possible that we could hear further from Dr. Coombs.

You do have our thanks for the fine help, the philosophical exposition of this problem which you have given us. Thank you very much.

Mr. COOMBS. Thank you, Mr. Chairman.

Mr. ELLIOTT. The committee will stand adjourned until next Monday. The reason for that is that tomorrow at 10 o'clock, the full committee meets to consider Public Laws 815 and 874, and it is thought that probably the consideration of those two items may carry us through Thursday, so that the committee will meet at 10 o'clock Monday morning.

(Thereupon, at 12:25, the committee recessed, to reconvene at 10 a.m., Monday, March 10, 1958.)

SCHOLARSHIP AND LOAN PROGRAM

MONDAY, MARCH 10, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION
AND SUBCOMMITTEE ON GENERAL EDUCATION,
COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10 a. m., in room 429, Old House Office Building, Hon. Carl Elliott presiding.

Present (Subcommittee on Special Education): Representatives Elliott (chairman), Green, and Nicholson. (Subcommittee on General Education): Representatives Bailey, McGovern, and Haskell.

Also present: Representatives Barden, Perkins, Landrum.

Staff members present: Charles M. Ryan, general counsel; Kennedy W. Ward, assistant general counsel; Mary P. Allen, clerk (Subcommittee on Special Education), and Robert McCord, clerk (Subcommittee on General Education).

Mr. ELLIOTT. The subcommittee hearing matters pertaining to the educational bill introduced by myself, and one introduced by the administration, and some 30 others, will be in order.

Today we will hear testimony from the American Vocational Association.

Dr. M. D. Mobley, executive secretary, American Vocational Association, Inc., and eight of his associates from across the United States will testify specifically on title XII of H. R. 10381, which would aid area vocational education programs in occupations essential to national defense.

Title XII of H. R. 10381 is an amendment to the George-Barden Act of 1946. I would like to say before we start with Mr. Mobley that I am very happy that the committee has with it today the original author of the George-Barden Act in the person of the chairman of the full Committee on Education and Labor, Mr. Graham A. Barden.

We are happy to have you, Mr. Chairman, and we think it is particularly appropriate in view of the fact that we have these leaders from all across the country working with the program which you sponsored and enacted a few years ago.

Mr. Mobley, you may proceed in any manner that you see fit.

STATEMENT OF M. D. MOBLEY, EXECUTIVE SECRETARY, AMERICAN VOCATIONAL ASSOCIATION, INC., WASHINGTON, D. C.

Mr. MOBLEY. Thank you, Mr. Chairman. I would like, if I may, to read my statement, since I am quoting several people, and I want to be sure to quote them correctly. My name is M. D. Mobley. I am

the executive secretary of the American Vocational Association, a professional organization in its 52d year of existence, with a membership of more than 30,000 vocational teachers, officials, school board members and others interested in the development and improvement of vocational education.

We are grateful for the opportunity to appear before this committee to present factual information regarding America's vocational education programs and to register support of the American Vocational Association for title XII of H. R. 10381 and other portions of the measure.

We have nine witnesses including myself. Each witness has prepared a formal statement which we would like to have included in the hearings. With your permission, the witnesses will summarize their formal statements, consuming not more than 5 or 6 minutes each.

Mr. ELLIOTT. Without objection the witnesses may summarize their statements, and the formal statements themselves will appear in the record following their summaries.

Mr. MOBLEY. Thank you, sir. We will also be most grateful if you will permit all the witnesses to present a brief summary of their testimony before any questions are asked. We believe that this procedure will save much time and will result in less duplication.

Here to testify primarily on title XII of H. R. 10381 are some of the Nation's outstanding leaders and authorities on vocational-technical education. They are capable and prepared to bring to this committee up-to-date factual information regarding the kinds of area programs now in existence and the need for further expansion of this phase of education.

First I would like to bring to your attention some facts regarding Russia's program of vocational and technical education of less than college grade. This important phase of Russia's education program has had very little publicity in this country as compared with the tremendous amount that has been given to the Soviet academic high schools and programs of college grade—embracing mathematics, the sciences, and engineering.

We believe we can truthfully say that Russia's development in the field of vocational and technical training of less than college grade has been just as phenomenal as has her college and university programs in the fields of science, mathematics, and engineering.

According to the March 5, 1956, issue of Life magazine, Russia had in operation at that time a total of "3,796 technicums, specialized trade schools, which turn out 70,000 technicians a year who perform routine scientific tasks."

There appeared in the December 1956 issue of Coronet magazine an article by William Benton, publisher of the Encyclopedia Brittanica and former United States Senator from Connecticut, under the title "The Soviet Tekhnikum: Ominous Threat to the West" with a subtitle "We have nothing to match these unique technological schools that turn out supertechnicians without a college degree."

Mr. Chairman, I would like to suggest that the entire article by Mr Benton be included as a part of the hearings.

Mr. ELLIOTT. Without objection, the article by Mr. Benton will appear immediately following the testimony of Mr. Mobley.

Mr. MOBLEY. The following is a brief quotation from Mr. Benton's article:

> Many of these tekhnikums turn out what might be called junior engineers. Actually these juniors are supertechnicians and specialists who fill vitally important secondary jobs, leaving graduate engineers free for more highly skilled work, and creating a surplus. And, this surplus is what is helping defeat us in the cold war in Asia and Africa.
>
> Trained in propaganda as well as science, the Soviet engineers and tekhnikum graduates are exported by the hundreds to underdeveloped nations thirsting for guidance and leadership in all fields of technology.
>
> The United States lacking this "middle-man" technician category, is wasting thousands of its well-trained engineers in comparatively second-rate jobs—as sales engineers, manual writers, glorified draftsmen and troubleshooters. Not only are we graduating little more than half the engineers that the Soviet is, but we are wasting their talents for lack of tekhnikum counterpart.

Two weeks ago on February 25, 1958, the Honorable Allen W. Dulles, Director of Central Intelligence, in a speech to the National Conference on "The Foreign Aspects of United States National Security" dealing with "The Soviet Economic and Trade Offensive" stated:

> The Soviet programs have also included a large-scale movement of technical personnel from the Communist bloc to the free world countries where aid is extended. More than 2,000 bloc technicians are now active in 9 of the newly developed countries in which United States comparable personnel number less than 1,000. Also large numbers of technicians are going from these countries to Moscow, Prague, and Peiping for their training.

This is further evidence of Russia's training program for technicians and how they are being used in underdeveloped countries.

In recent months it has been pointed out by several leaders in our National Government that in addition to the battle for the minds of men and the armament race, we are now in at least the first stage of an economic war with Russia and Soviet-dominated countries. Russia's Khrushchev has already made known, in no uncertain terms, Soviet plans in this field of activity. Only a few months ago he said to an American newspaper publisher, and I quote:

> We declare war upon you—in the peaceful field of trade. We declare a war we will win over the United States. The threat to the United States is not the intercontinental ballistic missile, but in the field of peaceful production. We are relentless in this, and it will prove the superiority of our system.

No one will dispute the fact that vocational education is one of our very important tools for making our people efficient in the production and distribution of goods. Almost 42 years ago—June 16, 1916, to be exact—the late Congressman Dudley M. Hughes said on the floor of the United States House of Representatives while the Smith-Hughes vocational education measure was under consideration—and I quote:

> National efficiency is the sum total of the efficiency of all individual citizens, and the national wealth is the sum of their wealth-producing capacity. * * * In the markets of the world we compete, not as individuals but as a unit against other nations as units. * * * This—unquestionably introduces a national element into vocational education.

In the United States we have very few institutions that are devoted exclusively to the training of technicians. We do have the nucleus around which to build. Every State and Territory has a State board for vocational education that has full authority to administer Federal vocational funds. These boards have had more than 40 years of successful experience in administering and developing vocational education programs.

The programs under their administration are so organized that they can be revamped and adjusted to meet changing conditions almost overnight.

These State vocational boards have authority to allot Federal vocational funds as well as State funds to all kinds of education institutions that is, public institutions, for operating vocational programs of less than college grade and for teacher training of college grade.

The witnesses who will follow me represent regular secondary schools, special vocational high schools, area and State vocational-technical schools, junior colleges, and senior colleges. They will tell you how Federal funds for vocational education are used in the respective institutions they represent. What I am trying to say is, that we have in existence in each State in this country an organization with more than 40 years of successful experience, that is ready to do in the development of all kinds of vocational-technical training programs of less than college grade that are needed for the security of our Nation and the well-being of our people.

Mr. Chairman, the current issue of the Farm Journal (March 1958), which goes to approximately 3.5 million of the farm homes of our Nation, carries a splendid article under the title, "The Kind of School We Need Everywhere."

It is a story of area vocational education programs in two States—Louisiana and Kentucky. This story in a very brief manner describes the sort of programs that are envisioned by title XII of H. R. 10381. I will appreciate it, if you will permit this entire article to be included as a part of the hearings.

Mr. ELLIOTT. Without objection, the article will be included immediately following the article from Coronet on "The Soviet Teknikum: Ominous Threat to the West."

Mr. MOBLEY. I might say, Mr. Chairman, that this same story could have been written about area vocational programs in a number of States, in quite a number.

Mr. Chairman, one of our witnesses, Mr. J. Fred Ingram, of Alabama, who served 2 years ago as president of our association, has found that he cannot be present today. I have the statement he prepared for presentation. We will appreciate it if you will let his statement be included in the hearings.

Mr. ELLIOTT. The statement from Mr. J. Fred Ingram will be included immediately following the statement of Mr. Mobley, the executive secretary of the American Vocational Association.

Mr. MOBLEY. Mr. Chairman, that concludes my formal statement.

(The documents referred to follow:)

[Reprinted from the March 1958 issue of Farm Journal]

THE KIND OF SCHOOL WE NEED EVERYWHERE

By Richard C. Davids

If your boy isn't going to farm or go to college, what then—start out as a flunky? Here's how farm boys and girls can get good job training—within bus distance of home

You've seen many a boy—maybe your own—who was just sort of lost after getting out of school.

He didn't want to go on to college—or couldn't; he wasn't interested in farming or he couldn't get a start in it. He worked for a while in a gas station, then drifted on to other jobs—always starting at the bottom.

I've just visited a kind of school that's tailormade to help boys and girls like this. It turns them into topnotch machinists, secretaries, draftsmen, and electronics specialists. Does it in 18 months to 2 years, too, and practically guarantees that they'll move directly into highly paid jobs.

Called an area vocational school, it's the type we've needed everywhere, especially in rural areas, to take over where high schools leave off. And we need them more than ever right now, when the farm population is declining.

Russia's satellites have removed all doubt of it. A college-trained engineer or scientist—to get the most out of his training and experience—needs an average of five technicians.

We don't begin to have that many, and as a result, many of our scientists are doing work that skilled technicians could easily handle. Technicians are well paid, and their work is important, indeed vital.

We've had vocational schools for years. But not enough of them. And nearly all have been in big cities, far out of reach of farm boys and girls.

Some far-sighted Louisiana educators recognized this problem 20 years ago and put up a few vocational schools in rural areas. They did such a good job that now the State has 27 schools, each serving 2 or 3 counties (called "parishes" in Louisiana).

I spent a week studying the school at Crowley (population 12,000) which handles students from Acadia and Lafayette Parishes. And if I'm not mistaken, it offers a pattern that farm people everywhere might study hard.

In this bayou country of big families, farm boys by the hundreds have been forced to leave the farm—just no more farmland left. The school at Crowley has helped ease the shift to town jobs.

Nearly half the tradesmen in the area learned their life's work there.

"It's the most important part of the town," said G. K. Cutrer, a banker.

Since the war, a big share of the students have been GI's in training, but now a growing number of the 550 who crowd the school from 8 a. m. til 10 p. m. are fresh out of high school. A third are still in high school, sampling several trades to see which suits them best.

Adults come too. In fact, any time that enough people want a course, area vocational schools can usually offer it.

Farmers learn welding, diesel repair, electric wiring—skills that will save them considerable money. A few come to learn a new trade altogether. They need it if they're going to get a decent job in town. There is no tuition charge. School runs the whole year long. There are no semesters or terms. A student simply begins as soon as there is room and his application approved.

Each student works at his own speed. He can go from one job to the next as fast as he picks up a new skill. No wonder you don't see boys loafing or bored. The whole place has more the air of a busy industry than a school.

Rules are strict. Students punch in on a time clock, and a boy with only three unexcused absences is dropped. A boy doesn't leave one job until he's proficient at it. In auto repair, for instance, he has to overhaul a transmission in the 3 hours or so allotted by a mechanic's "flat-rate book."

Beyond that, the school trains a boy to open up his own business, even serves as an employment agency. Hardly a day passes but what some business—a Texas oil company or Detroit auto manufacturer—calls for boys.

During my stay at Crowley, 5 farm boys, after 1,200 hours of training as draftsmen, went to work for architects in Baton Rouge at good pay.

"The big trouble," says the school director, J. W. Mitchell, "is keeping the boys until they've finished. The offer of a good job sometimes argues louder than a diploma."

What is the cost of a school like this? About $325 a year per pupil for everything, or about like the average high school. Since most courses are 2 years long, that's a total of $650 for each pupil. Not much when you remember that it's fitting a boy for a lifetime of work.

Let's see what that expenditure can mean to a farm boy. Norvin Langlinais got out of the marines and started farming, but he decided that three families were too many on one place.

He took the 2-year farm mechanics course at the Abbeville, La., school and took a job in the local Ford tractor shop. When it came up for sale, he scraped together enough cash to buy it.

Farmers say he's one tractor man who gives good quick service. He has done so well that he hired another graduate of the school to assist him.

I asked Norvin what he might be doing without his school training.

"Probably day labor in a rice mill or roustabout work in the oilfields. There aren't many unskilled jobs left."

We heard that story again and again. A farm boy without special training finds just about every door locked to him, except unskilled, low-pay work.

Two Abbeville students bought out a radio and TV shop. Another started his own auto air-conditioning business.

Do those seem like highly specialized skills? They are. If you haven't visited a modern vocational school, you'll be amazed at the contrast with yesterday's "manual training and welding shops." No wonder Louisiana is winning a reputation among industrialists as a place to get topnotch craftsmen.

So, too, is Kentucky. Stop in at Paintsville and visit the Mayo School there if you ever go through Kentucky.

A family from Hershey, Pa., did that 2 years ago and were so impressed that they dropped their boy off at the dormitory and left him to start school. He's back home now on a good job, thanks to his training.

A boy came who had worn out his welcome at 2 high schools. He hated math, couldn't do fractions. Within the year he was doing trigonometry. Why? Because he needed it to be a machinist, and could see a point in "wading through that stuff." Learning for the sake of making a living is a powerful spur.

Elmer Stevenson was a mountain farm boy who wanted to become a welder. He had no hands. They had been burned off. The Mayo school sent him home—there were too many able-bodied boys waiting to get in. But he came back again and again until finally he was enrolled. After a heroic struggle he learned to weld, holding the torch with his elbows. Two years after he got a job in Detroit he won a prize as the fastest welder in the factory.

Good vocational training can change the lives of people.

I talked to a man of 52 who, after 20 years in the coal mines, could no longer work underground. He was driving 62 miles each way to school, learning auto repair along with his son who was studying body work. After only 6 months in school, they had more business than they could begin to handle after hours at home. His teacher told me: "We could place 4 times the men we can turn out."

A boy in welding took a job in West Virginia, came back a week later and took the whole class back to start work. The last two farm boys out of the electronics department in Lexington went to work for $625 a month—quite a salary for mountain boys with 2 years' training beyond high school.

Industry keeps a sharp watch on the area around a vocational school as a place to put a factory. The Diamond Match Co. picked a site outside Paintsville, largely because of the Mayo school. The director said: "I've been kept busy the last 2 years showing the school to site locators for industry."

Kentucky has 13 other area vocational schools, but that isn't nearly enough. James L. Patton, State director of vocational education, says that every school has waiting lists.

Minnesota has several fine area vocational schools in rural areas.

Farm Journal goes on record as strongly in favor of State aid to provide for more funds for area vocational schools. We need such schools to keep America strong, and we need them for the sake of farm boys and girls.

Why not do something about it in your community and your State?

STATEMENT BY J. FRED INGRAM, STATE SUPERVISOR OF TRADE AND INDUSTRIAL EDUCATION AND FORMER PRESIDENT OF THE AMERICAN VOCATIONAL ASSOCIATION

My name is J. F. Ingram. I am State supervisor of trade and industrial education in Alabama. I have been actively engaged in public education for 37 years. This statement is presented on behalf of the American Vocational Association and represents the official position of its members on the measure H. R. 10381.

Two years ago it was my pleasure to serve as president of the American Vocational Association. In that capacity I had the good fortune to travel extensively in the United States. I saw much of public education in this country. I witnessed the almost universal problems of inadequate housing for schools, shortage of well-trained teachers, and the resultant lack of enrollments in certain areas of learning such as the sciences and mathematics. I talked with vocational educators throughout the Nation and found them greatly concerned over the deficiencies of vocational students in the areas of science and mathematics which are more and more basic and essential backgrounds for students learning a skilled trade or a technical occupation.

Never before has Congress had before it a truly comprehensive legislative proposal which included both general and vocational education such as is true of H. R. 10381. However, it has long been recognized that general and vocational education are both highly important to sound economic growth of a nation as well as to our national defense. Anything that will improve general education will also improve vocational education and vice versa.

The proposals involved in H. R. 10381 would provide stimuli for our greatest intellects to pursue educational courses which would greatly improve their own economic status and in turn enable them to make their maximum contributions to our national welfare and defense. Great numbers of our young people with brilliant minds cannot possibly finance themselves while getting a college education. This bill, if enacted, would make it possible for many of them to develop to their full capacities in certain critical areas.

The mere enactment of such legislation would lend emphasis and prestige to education and to science and mathematics in particular. This would greatly increase the enrollments in these subjects. There can be no doubt but that it would have lasting and continuing results by enabling more people in generations to come to educate their children better.

Perhaps one of the most excellent features of the bill is the one which will enable those who obtain scholarships, and who go into teaching as a career, to discharge their scholarship obligations if they teach for 5 years. As a general rule, many of those who teach for 5 years will probably continue as teachers. This provides an excellent means of recruiting well-educated teachers for our public schools.

Title XII, authorizing funds for area vocational education programs, gives the bill a degree of balance which should not be overlooked. Through the provisions of this title of the measure a great contribution can be made toward alleviating certain serious manpower problems.

1. It can help greatly in making it possible for the people of rural areas who are in excess to the manpower needs of agriculture to make the transition to employment in occupations essential to the national welfare.

2. It can help greatly through the training of technicians who can relieve the engineers of much of the routine nonengineering functions they now perform but which could be as well done by well-trained technicians.

3. It can help greatly by providing opportunities for those displaced by automation and other technological changes, retraining for employment in essential occupations in which there are shortages of trained manpower.

4. It can help greatly by making it possible to provide extension training for people in skilled and technical occupations to enable them to keep abreast of the rapid technological and scientific changes. These are all very important contributions to any all-out effort to shore up our system of education in order to compete successfully with other nations in this scientific and mechanical age.

We must not overlook the fact that for each engineer there must be several technicians and several more skilled craftsmen to make the engineer's dream a reality, and to make, install, service, repair, and maintain complicated and expensive equipment used in modern industry.

The authors of H. R. 10381 are to be commended for presenting a bill which gives consideration to the need for more skilled and technically trained workers than just the scientists and engineers which are also needed. However, scientists and engineers without an adequate number of supporting workers would be of little value. This bill, if enacted into law and funds authorized are appropriated, will go far toward the promotion and development of a sounder educational program in the United States.

Members of the American Vocational Association are highly favorable to such a measure.

Mr. ELLIOTT. Our list for today shows that our next witness is Mr. James L. Patton, State director of vocational education, Frankfort, Ky.

We have with us this morning the gentleman from Kentucky, Mr. Perkins. I will recognize the gentleman at this time to introduce Mr. Patton.

Mr. PERKINS. Mr. Chairman and members of the committee, it is a great pleasure for me to present Dr. James L. Patton to this committee. I first became acquainted with Dr. Patton more than 20 years

ago, when he was principal, and one of the outstanding principals in eastern Kentucky, of an eastern Kentucky high school. He did that job so successfully that he was later selected as the director of the Mayo Vocational Educational School. Any of you who are acquainted with that particular school knows that he built that school as one of the most outstanding in the whole country.

Because of that outstanding accomplishment, he was later selected as director of vocational education in the Commonwealth of Kentucky. He has been serving in that capacity for more than 5 years. Dr. Patton knows rural life and he knows something about the subject. I will present Dr. Patton at this time.

Mr. NICHOLSON. Mr. Chairman, I would like to ask this gentleman a question who has just testified.

Mr. ELLIOTT. The gentleman from Massachusetts, Mr. Nicholson, Mr. Mobley, desires to ask you a question.

Mr. NICHOLSON. Do you really believe that in Russia the engineers and everything are superior to what we produce in this country?

Mr. MOBLEY. No, I do not. I do not think they are superior to ours.

Mr. NICHOLSON. That is all.

Mr. BARDEN. Mr. Chairman, if you do not mind, I have a question to ask of Mr. Mobley.

Mr. ELLIOTT. Mr. Barden.

Mr. BARDEN. Dr. Mobley, we have been dealing with this problem for quite a long time.

Mr. MOBLEY. You are certainly right.

Mr. BARDEN. I must say you have done a grand job. I notice you did not touch on the subject of how to handle the aid or assistance to these schools, but you more or less dealt with their need. Personally, I do not need any argument for the need. I am convinced of that. I do need a little assistance in how the job can be done. Is your idea for funds to be allocated to the States, for just the implementation of the present setups that we have in the States, or is it your idea that we make some funds available for equipment in the schools that we now have, plus those that we may establish?

I do not mind giving you, first, my view. You and I have discussed it between us on many, many occasions. That is, I think, the greatest handicap that the vocational program has had in this country has been the fact that we did not have equipment in those schools. We expect those boys to come out as well equipped from that school as we would one coming from a school that has $10,000 worth of first-class equipment with which to work.

I would like to know, in the general area of the schools and the establishment of area schools, which I understand to be those to which the smaller schools would feed, do you choose to emphasize equipment or the setting up of the area schools?

Which do you regard as being of prime importance, equipment to all, if it comes to a choice, or area schools?

Mr. MOBLEY. That would be a rather hard decision.

There is no question in my mind that one of the great needs, and, if I may say, one of the great weaknesses of our present vocational system is lack of adequate equipment. It would be difficult for me to say whether we need equipment more than we need new area schools. We need both. You have doubtless noticed that this bill (H. R. 10381,

title XII) provides that a portion of the money could be used, in fact you could use it all, for equipment. If title XII is enacted in its present form, I would guess that the States would use a very large percent of the funds for equipment—especially for the first few years.

There is a very great need for equipment. I think the witnesses who will follow will point up this fact. Every one of them, in talking to me, has pointed out the fact that there is a tremendous need for equipment.

Mr. BARDEN. Would you feel that the amount of the equipment, of course, taking into consideration the amount of money available, would be determined by your State vocational board?

Mr. MOBLEY. Yes, sir. I would recommend, Mr. Barden, that this be left to the discretion of State boards for vocational education. For instance, in some States they have done quite a good job in equipping their vocational schools. Such States should be able to use the money for other purposes authorized in title XII. There are other States which have made little progress in acquiring equipment. They, of course, ought to be permitted to use funds made available for that purpose, especially for the first few years.

Mr. BARDEN. What I would like to do is this, and I am looking at it from just my present point of view, not to leave the appearance of attempting what might be termed as a crash program, or multiplying many times the amount of money for the vocational training program. We have the vocational program outlined. Of course, Congress, if it saw fit, could extend and increase the amount. I am not so sure that that would be too good for the program, certainly in the next few years, but I am positive in my own mind that the vocational schools in America could do at least, and I say this because I think I am right, at least 40 percent more good than they have been doing if they had the equipment.

Mr. MOBLEY. I agree wholeheartedly with your statement.

Mr. BARDEN. Following that a little further, that being so amply justified, so easily understood, I am inclined to think we could stay in that field and treat the question of the great expansion of the movement either separately or at a later time, when we had proven beyond a doubt that the equipment was amply justified.

Mr. MOBLEY. That is right.

Mr. BARDEN. That is all I had.

Mr. BAILEY. Mr. Chairman, might I ask a question?

Mr. ELLIOTT. Mr. Bailey.

Mr. BAILEY. Doctor, I would like to get your reaction to a situation that occurs to me at the present time. In my home State of West Virginia we have the county unit system. In my home county, they have 12 separate, what we would call first-class, accredited high schools, most of them carrying on vocational work. It occurs to me that a concentration of effort in the establishment of a trade school, where all of that is within the county unit, would be carried on in one school, and transporting the pupils would be much more economical and much more effective than scattering your ammunition to 12 high schools.

Mr. MOBLEY. I agree with you. That is one of the purposes of this bill. That is already being done on a limited scale in some States. Title XII of the measure would certainly encourage further development along this line.

Mr. BAILEY. None of those schools are more than 20 miles distance from each other. It looks like it would be a decided improvement.

Mr. LANDRUM. Would the gentleman yield?

Mr. BAILEY. I will yield.

Mr. LANDRUM. A reading of the section 1202, giving the definition of an area vocational program, if adopted as written on page 60 of this bill, would make it mandatory, almost, that you do that. The child has to be above 16 years of age or complete junior high school. If you operate under this program, if this bill is passed, you would be nearly compelled to have that.

Mr. BAILEY. Thank you, Mr. Landrum.

That is all, Mr. Chairman.

Mr. ELLIOTT. You may proceed, Mr. Patton.

STATEMENT OF JAMES L. PATTON, STATE DIRECTOR, VOCATIONAL EDUCATION, FRANKFORT, KY.

Mr. PATTON. You see here the organizational chart in Kentucky. The State of Kentucky happens to be one of the pioneers in developing a statewide area vocational education program.

(The chart referred to follows:)

CHART 1

CHART 1
PRESENT
ORGANIZATIONAL CHART FOR THE ADMINISTRATION OF
TRADE AND INDUSTRIAL EDUCATION AND DISTRIBUTIVE EDUCATION PROGRAMS
IN KENTUCKY

Mr. PATTON. It is the consensus that if this amendment is enacted into law, very little money would be necessary from the standpoint of administration, because we already have the machinery set up to do an effective job of administering the program.

You will also see here that the organizational pattern of conducting the programs is very flexible.

In Kentucky we have one area school that is conducted by a senior college. We have 10 schools that are conducted by local boards of education, and then we have three schools that are conducted by the State board of education, and they are called State institutions.

The next map—a map of Kentucky—shows you the location of concentrated programs by these black dots.

(The map referred to follows:)

CHART 2

KENTUCKY AREA VOCATIONAL PROGRAMS & EXTENSION CENTERS
EACH CIRCLE REPRESENTS AN AREA OF 20 MILES DIAMETER
* Two schools located in Paducah and Louisville

Mr. PATTON. By the way, copies of these charts are included in the memorandum which has been handed to you.

These are the centers. You will find that going out from each one of these concentrated centers is an extension center. This system has not yet been put into full operation in Kentucky. We are only winking at the problem because we haven't sufficient money to do the job.

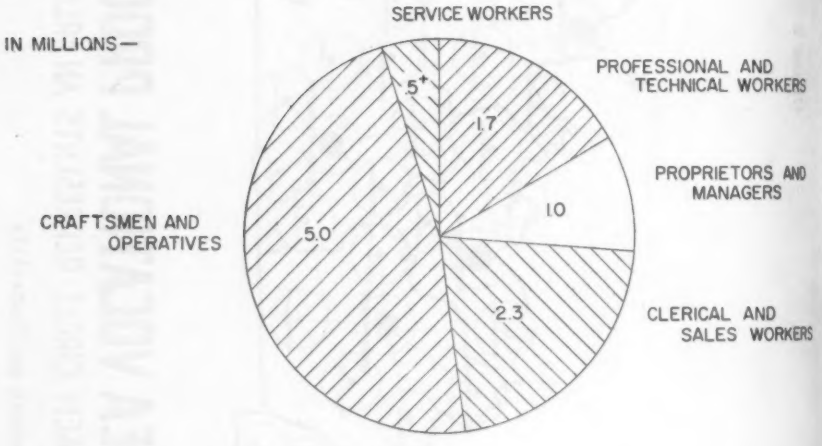
We go out from the concentrated center where a school is located and many programs are put on, with mobile units and other methods that make it possible for our extension centers to serve rural Kentucky. Kentucky and many of the States of the South are rural and this area program idea is an excellent way to get the program of vocational technical education to rural people.

In this chart, the Secretary of Labor has set forth the expanded needs in the labor force of the Nation by 1965.

(The chart referred to follows:)

CHART 3

EXPANDED NEEDS IN THE LABOR FORCE OF THE NATION BY 1965*



▨ THOSE FIELDS IN WHICH THE AREA VOCATIONAL EDUCATION PROGRAMS CAN PLAY A VITAL PART

*JAMES P. MITCHELL, SECRETARY, U.S. DEPARTMENT OF LABOR

Mr. PATTON. Now we do not claim we can do the whole job, but we can play an important role in training workers for the areas which have been shaded here on this chart.

Mr. HASKELL. Would the gentleman yield for a question? What percentage of the people in that cross-hatched area would you say the vocational education school would be responsible for training?

Mr. PATTON. They would be responsible largely for this whole area here, marked 5.0.

Mr. HASKELL. You are not implying that industry does not train most of the people.

Mr. PATTON. Naturally, after we have completed the preemploymnet training, our graduate go into industry, many as apprentices. We continue to work with them while in industry by providing courses that will upgrade them in their occupation. Most of this is related technical instruction.

Mr. HASKELL. You do not make a claim of a percentage of the training?

Mr. PATTON. Industry would provide the on-the-job training.

Mr. HASKELL. My conception is that industry does at least 90 percent of the job.

Mr. PATTON. It depends a whole lot on where you are located. In Kentucky, that is not true. I happen to speak for Kentucky, and we are a rural State. A larger percent of our people have their preemployment training in the schools and then they go into the apprenticeship program in industry.

Mr. HASKELL. Do you train a toolmaker, for instance?

Mr. PATTON. In our schools we provide preemployment training for potential toolmakers and related instruction for the apprentice.

Mr. BAILEY. I have a question, Mr. Chairman.

Mr. ELLIOTT. Mr. Bailey.

Mr. BAILEY. Is the gentleman from Kentucky aware that the upcoming 1959 budget eliminates about half of the funds for your apprenticeship training, when Federal funds are involved?

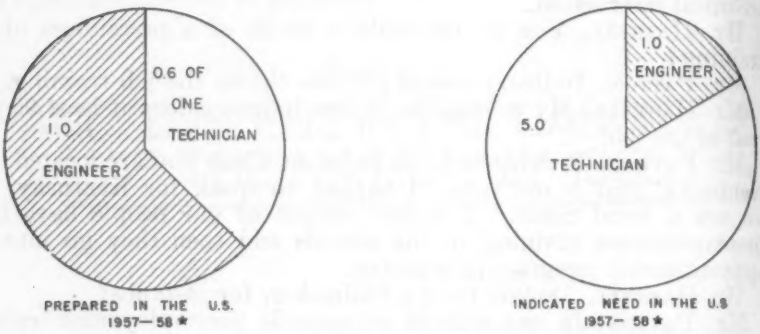
Mr. PATTON. No; I am not aware as to what is in the budget for the apprenticeship program. But we work hand in hand with the apprenticeship program and industry after they have had their preemployment training, working with industries of the State. If you are in a highly industrialized section, I am sure that more of the people would be trained in industry than would be in Kentucky.

This shows the ratio of the engineer to the technician.

(The chart referred to follows:)

CHART 4

THE IMPACT OF TECHNOLOGY UPON THE AREA VOCATIONAL EDUCATION PROGRAM



IMPLICATIONS FOR AN EXPANDED PROGRAM

★ A REPORT OF THE KENTUCKY STATE CONFERENCE ON VOCATIONAL-TECHNICAL EDUCATION.

Mr. PATTON. Dr. Mobley mentioned that in his formal statement, and here is what has been brought out from a conference held in Louisville, in which labor leaders, industrial leaders, and educators participated.

At the present time in the United States, taking the country as a whole, there is six-tenths of a technician to one engineer.

The wholesome ratio would be 5 technicians to 1 engineer, taking the country as a whole. That will vary in different localities because of the variety of industry in different sections of the country.

This chart shows the out-of-school youth of 16 and 17 years of age.

(The chart referred to follows:)

CHART 5

OPPORTUNITIES

THROUGH THE AREA VOCATIONAL EDUCATION PROGRAM

AN INTERESTING COMPARISON
OF
OUT-OF-SCHOOL YOUTH*
(16-17 YEARS OLD)

*BUREAU OF CENSUS, 1950 IN-SCHOOL OUT-OF-SCHOOL

Mr. PATTON. This, representing the United States as a whole, shows that about a fourth of our 16- and 17-year-old youth are out of school. That is a rather serious problem because these boys and girls, who are not prepared to participate in our scientific age, will eventually, too many of them, because social problems if they cannot become adjusted or find educational opportunities.

Many of them should continue their schooling, with others going into college, and others, I am sure, going into the vocational education program. Kentucky ranks highest in the Nation, with 43.7 percent of the people in that age group in the 1950 census out of school. So you gentlemen know the seriousness of that problem.

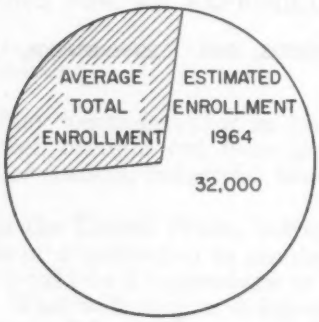
According to a report made by a special committee that studied area programs, the average total enrollment that we now have in Kentucky schools is around 9,000. By 1964 it is estimated that we should serve 32,000.

(The chart referred to follows:)

CHART 6

A CHALLENGE

TO THE AREA VOCATIONAL EDUCATION PROGRAM



AVERAGE ENROLLMENT IN KENTUCKY-SKILLED WORKERS & TECHNICIANS, 1956-1957 *

*REPORT OF THE GOVERNORS ADVISORY COMMITTEE

Mr. PATTON. This chart reflects the need for teachers.

(The chart referred to follows:)

CHART 7

OUR TECHNICAL AGE REQUIRES MORE AND BETTER TRAINED TEACHERS IN KENTUCKY

Mr. PATTON. This shows the present number of teachers which we have, with 210 full-time instructors across the State teaching in the trade and vocational schools, and 76 part time.

Mr. BAILEY. Doctor, at that point, what is your mortality of those trained, the individuals? They do not all stay in the teaching profession. Who is raiding you right now?

Mr. PATTON. Industry is raiding us, and it is rather difficult to get teachers because we cannot pay the salary.

Mr. BAILEY. What percent of your trained individuals there continue in the teaching profession, and stay in Kentucky to carry on your program?

Mr. PATTON. If they reach the age of 40, our mortality rate is very low, because they have reached the place in too many cases where industry, unfortunately, does not want them. But if they are below 40—around the age of 25 to 35—it is rather difficult to hold them. If they prove they are outstanding, then industry steals them.

You can see the great need for teacher training in an expanded program that this chart sets forth.

This is a very important chart. This shows our present number of training stations where young men or young women can go in and have a place to work, and gain the necessary skills for successful employment.

(The chart referred to follows:)

CHART 8

PRESENT FACILITES CANNOT MEET NEED FOR PREPARATORY PROGRAM** IN KENTUCKY

* KENTUCKY'S AREA VOCATIONAL PROGRAMS TURNED AWAY A GREATER NO. OF PEOPLE THAN THEY HAVE IN THE TOTAL NO. OF TRAINING STATIONS.....

** REPORT OF THE GOVERNOR'S ADVISORY COMMITTEE

Mr. PATTON. Next is shown the number of people who were refused entrance to the school last year, 1956–57.

The number of people who were refused entrance exceeds our total number of training stations. Next is shown the estimated need of training stations by 1964 according to a recent survey and a study relative to this program.

In Kentucky, we show the amount of money that was spent on equipment, in 1956–57—only $71,072.02.

(The chart referred to follows:)

CHART 9

RECENT SURVEY INDICATES EQUIPMENT NEEDS IN KENTUCKY'S AREA VOCATIONAL PROGRAM*

*REPORT OF THE GOVERNOR'S ADVISORY COMMITTE

Mr. PATTON. That dropped materially in 1957–58 because we tried to raise the salaries of teachers in order to hold them. When we raised the salaries of teachers, we had to cut down on equipment. So you can see that for our Statewide program, only a small amount was spent for the equipment that is so essential to training.

Certainly we would have been up against it if it had not been for surplus property, and picking up equipment here and there wherever we could get hold of a piece.

Next is shown the expansion necessary to bring present facilities up to date. And this does not take care of the expanded program essential by 1964.

Mr. ELLIOTT. Let me ask you a question at this point. Do I understand from you that the entire Kentucky vocational program operated in the year 1957–58, the school year we are in now, with $44,000 worth of equipment?

Mr. PATTON. No. That was not $44,000 worth of equipment. It was the money expended for equipment during that year.

Mr. MOBLEY. New equipment?

Mr. PATTON. New equipment or used equipment.

Mr. ELLIOTT. That is my question. I say you operated the whole system with $44,000 worth of equipment for that year?

Mr. PATTON. That is right.

Mr. ELLIOTT. What might that include?

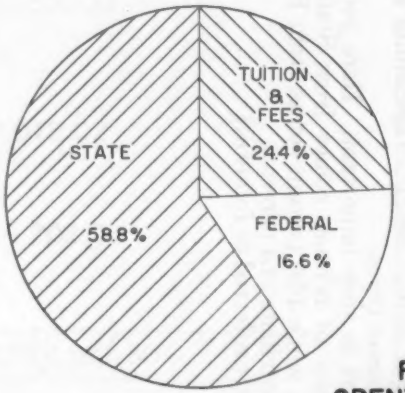
Mr. PATTON. Well, it would include some electronics equipment, a small amount; it would include some machine shop tools and equipment; it might include some auto mechanics' equipment—testing equipment of different types.

This chart is very important. Here you can see that 58 percent of our source of revenue comes from State funds—something over 58 percent, while 16.6 percent comes from Federal funds, and tuition and fees contribute 24.4 percent.

(The chart referred to follows:)

CHART 10

KENTUCKY'S FINANCIAL EFFORT IN THE DEVELOPMENT OF THE AREA VOCATIONAL PROGRAM



STATE	836,544.62
FEDERAL	237,120.54
TUITION & FEES	348,033.87
	1,421,699.03

FINANCIAL SUMMARY OF MONEY SPENT IN THE PREPARATION OF SKILLED WORKERS AND TECHNICIANS 1956–57*

*REPORT OF THE SUPERINTENDENT OF PUBLIC-INSTRUCTION FOR THE BIENNIUM ENDING JUNE 30, 1957. VOL XXV, DEC. 1957, NO. 12

Mr. PATTON. The fees are largely from veterans' tuition, and this enrollment is on the decline. So you see what a problem Kentucky is faced with in depending upon something over 40 percent from Federal funds and from veterans' tuition to finance the program.

This is job placement.

It shows that for Kentucky, even though the Federal Government is putting some 16 percent into the program, 23.5 percent were placed in out-of-State jobs in 1956 and 1957.

(The chart referred to follows:)

CHART 11

KENTUCKY'S AREA VOCATIONAL PROGRAM SERVES BOTH THE STATE AND THE NATION

A HIGH PERCENTAGE WERE PLACED IN THE OCCUPATION FOR WHICH THEY WERE PREPARED

* REPORT OF GOVERNOR'S ADVISORY COMMITTEE — 1957

** SINCE MANY HAD JUST COMPLETED TRAINING AT THE TIME OF THIS SURVEY THE SCHOOL DID NOT HAVE CONFIRMATION OF PLACEMENT

*REPORT OF THE SUPERINTENDENT OF PUBLIC INSTRUCTION FOR THE BIENNIUM ENDING JUNE 30, 1957. VOL. XXV, DEC. 1957, NO. 12

Mr. PATTON. The other chart shows the jobs in which they were placed. The percentage placed in trades for which they were trained is outstanding—as you can see, it is better than 50 percent.

(The chart referred to follows:)

CHART 12

INTERESTING ADVANTAGES OF THE AREA PLAN

1. WIDE SELECTION OF TRAINING
2. GREATER COMPLEMENT OF INDUSTRIAL TYPE EQUIPMENT
3. QUALITY TEACHERS THROUGH GREATER ENROLLMENT
4. DELIMITS OVER-TRAINING
5. VERSATILITY OF FACILITIES
6. FLEXIBILITY OF SCHEDULES
7. LESS EXPENSIVE BECAUSE OF FULLER UTILIZATION
8. GREATER COORDINATION BETWEEN PREPARATION AND PLACEMENT
9. PROVISIONS ARE MADE FOR SPECIAL AND EXTENSION CLASSES
10. DUPLICATES A BUSINESS AND INDUSTRIAL ENVIRONMENT
11. MORE EFFECTIVE ADMINISTRATION AND SUPERVISION

Mr. PATTON. One major advantage of the area program is that it is sound from an administrative point of view. You can administer more programs with a smaller staff. It is also sound from the standpoint of instructional equipment, because you can concentrate your supplies—you can rotate them from one school to another, and make technical equipment, books and visual aids, go a long way and serve a lot of people, because you are serving an entire area.

From the standpoint of economy, from the standpoint of educational efficiency, from the standpoint of administration, and from the standpoint of supervision, the area program that Kentucky has been developing over the years has proven to be absolutely sound.

(The document referred to follows:)

NATIONAL DEFENSE THROUGH THE OGANIZATION AND DEVELOPMENT OF AREA VOCATIONAL EDUCATION PROGRAMS

HISTORY OF KENTUCKY'S AREA VOCATIONAL EDUCATION PROGRAMS

Kentucky has been one of the pioneer States of the Nation in recognizing the importance of the development of area vocational education programs. In fact, the movement started in 1938 when the State purchased a plot of ground on which was to be built a vocational school. All through the years of development since that date, the State has been a partner with the Federal Government in carrying through to realization the development of centers from which vocational programs would operate on an area basis.

The equipment and buildings that were used to conduct the training program that was carried on by the National Youth Administration were taken over by the State after the program was closed. These buildings and equipment furnished a nucleus for the organization and development of 10 of the 14 centers that we now have in operation.

During World War II, these centers were used to conduct a war training program which enabled the State to further take advantage of Federal funds in providing equipment that could be used for educational purposes. After the close of the war training program, the State was able to obtain title to such equipment.

The money provided under the GI bills for World War II and Korean veterans continued the march of the participation of the Federal Government in the growth and development of the area programs in the State.

The amendment of the George-Barden Act, as set forth by the proposed legislation, providing the appropriation of funds to the States in the development of area vocational education programs would only be consistent with the long history of development of such programs in Kentucky.

PHILOSOPHY IN THE DEVELOPMENT OF AREA VOCATIONAL EDUCATION PROGRAMS IN KENTUCKY

The leaders in vocational education have long since believed that the defense and security of Kentucky rests with the security of the Nation. To develop the skills of people who have talents, interests, and aptitudes so that they might use their skills to enhance the production of food and fiber always has and will continue to improve the defense and security of the country. To educate an individual where he is and let him find employment in any section of the Nation where he can make his greatest contribution is one of the fundamental guidelines in developing the area vocational education program in Kentucky. Then, too, the development of a pool of skilled manpower is fundamental in the growth and development of industry in any section. Industry has a tendency, other things being equal, to gravitate to areas where there is sufficient skilled labor to meet at least their essential needs. It is also important, due to the advancement in technology, to provide a pattern of vocational education so that all interested and worthy individuals or groups will have opportunities for retaining or upgrading in the technical, skilled, or semiskilled occupations.

Charts 1 through 12 will convey the need for an expanded program in the training of skilled and technical manpower that will have its implication on our national defense and will certainly convey the importance of enacting into law the proposed amendment to the George-Barden Act that sets forth the appropriation of $20 million to the States for the organization and development of area vocational education programs.

Chart 1

This chart sets forth the administrative machinery that is already set up to operate the program the proposed legislation would make possible. You can readily see the flexibility, from an administrative point of view, as to how the program can operate. The chart sets forth that Kentucky has 3 State schools that operate under the State board of education, 10 that operate through local boards of education, and 1 school that is operated by a senior college. Therefore, any State can readily operate the area program under its existing patterns of operation. This would cut down materially the administrative cost in the implementation of the area program made possible by the proposed legislation.

Chart 2

This map shows the location of the area vocational program centers and also sets forth the extension plan that has been developed, the purpose of which is to take as much of the technical and skilled program that is practical and possible to the people. The extension centers that are shown on the map have not been carried through to their full realization because of lack of funds. We feel that this is an excellent plan to provide related instruction for apprentices and the upgrading of workers who are now employed, and, also, to provide basic training in the different technical fields that is essential for industrial advancement as well as educational improvement of the people. The programs that have been taken to some of the centers that are set forth on the map through mobile units and other methods have proved to be very successful. The only bottleneck is the lack of sufficient funds and qualified teachers to do an effective job.

Chart 3

The information set forth on this chart exemplifies facts that were recently published by the Secretary of Labor relative to the expanded needs of the labor forces in the country. The area vocational program, if carried through to full realization, could be instrumental in helping to provide educational opportunities so that we might be able to help meet the expanded needs in the labor force, as set forth by the Secretary of Labor. We recognize that there must be a tremendous retraining as well as upgrading of the semiskilled labor force because of the many problems that have been brought about by automation. This area plan could certainly be instrumental in helping to adjust our labor force to the many advances in technology in industry. According to the National Manpower Council, the industries that adopted a complete plan of automation still require a large number of men in the traditional skilled manual trades such as electricians, millwrights, tool and die makers, and all-around machinists. This fact we want to keep in mind even though at the present time we are pressured for a sound area program for educating technicians of all types.

Chart 4

The area vocational education program would be able to add impetus to the effort of bringing about a more desirable balance between the number of technicians to each engineer in the country. You can readily see from the chart that we are extremely out of balance at this time. In a recent conference held in Louisville, Ky., on technical education, in which many industrial, labor, and educational leaders participated, it was repeatedly brought out that too many engineers were doing work that fell in the category that a technician should be doing, such as manual writing, drafting, and general troubleshooting. If an increased number of technicians could be provided, then that would relieve the engineer to stay in the category of planning and would be a better utilization of the manpower of the Nation. According to the press, many of the failures in our missile and rocket program have been brought about, not because of a weakness in scientific knowledge, but because of technical, mechanical, and electrical failures. We certainly must recognize the importance of the scientist in the laboratory but we must always keep in mind that it is a long distance from the laboratory to being able to get the missile and the rocket into outer space. To this end, we don't want to lose sight of the fact that the engineer, designer, layout man, draftsman, cost analyst expert, skilled craftsmen in production, merchandising expert, salesman, installer, operator, and maintenance man, all have an important place in our total industrial development.

Chart 5

The information conveyed in this chart can be very damaging to a democracy. The number of young people out of school in the Nation and in Kentucky at the ages of 16 and 17 should present a very critical problem for all of us. They have not yet reached the employable age and therefore, during this time in the Nation's history when routine jobs to be done to keep such young people busy around the home no longer exist, if we fail to provide the type of educational program that could meet the specific needs of this age group, we will be faced now with a continued growing of juvenile delinquency and in the years ahead, of increased responsibility on the part of the Federal Government to provide welfare funds for these young people when they reach adulthood.

Chart 6

This chart is applicable to Kentucky and reflects the need that was pointed up by a recent committee that was making a study of educational programs responsible for the training of skilled manpower and technicians. It can readily be seen that, even though we are trying to make an effort, we are just touching the surface in our responsibility of reaching the number of people who should be provided educational opportunities in these fields. We have the people who need the educational opportunities. The Nation and the State need the skilled manpower now and in the future. The major bottleneck is insufficient funds to do the job.

Chart 7

The previous chart, No. 6, sets forth the educational responsibilities we are faced with in Kentucky, and it is my conviction that similar problems exist throughout a great percentage of the States. Even though we have such needs, we cannot begin to meet them until we are able to attract and train more teachers. This would necessitate an expanded teacher-training program far beyond any-

thing we have established in Kentucky and also would necessitate additional funds to raise salaries to the level that they would at least give the same type of pay that a foreman would receive in a modern industrial plant. At the present time, we are unable to attract the type of teachers, and in sufficient numbers, to do an effective job in the now-organized area-vocational-education programs. This problem will become more acute in the days ahead because the standards in the selection of teachers must be raised in order to have the type of instruction that is required in an educational program for the training of technicians.

Chart 8

The problem set forth in this chart is very acute. We must recognize the danger with which the democracy is faced when public institutions must turn from their doors individuals who are seeking opportunities to improve themselves educationally and, in turn, improve the security of the Nation. The ill and evil effects are self-explanatory and should be recognized by all of us in places of leadership. It has been pointed out in the brief history in the development of the area programs in Kentucky that many of our present facilities have been made possible because of obtaining equipment that was purchased by the Federal Government. The need in Kentucky, and I am sure in practically all of the States in the Nation, for improved educational equipment on which might be organized a sound instructional program for the training of skilled craftsmen and technicians is very critical. The problem is also further complicated because of the age of the equipment we now have that is being used for instructional purposes as well as the great need for providing science-laboratory equipment that is vital and essential in the training of technicians.

Chart 9

The information set forth in the chart shows that Kentucky is able to do very little in providing instructional equipment. You can readily see that the amount of money that has been used for the purchase of instructional equipment in the past 2 years is nominal in comparison to the great need for bringing the equipment up to standard. The recommendation that is set forth in the chart was taken from the survey of the committee that made a study of the vocational area educational programs and the amount of money needed to bring them up to standard. This is only for the programs now in operation and certainly does not reflect the expanded facilities that are needed as set forth in chart 8.

Chart 10

The State of Kentucky has made a reasonable effort in supporting the total area vocational program. Even though this is true, we cannot begin to meet the extreme demand for an expanded program in this field of education. The chart reflects that the program is dependent to a great degree on tuition and fees. Much of this is funds coming from veterans, made possible under the GI bill. It is needless to tell you that money from this source is declining rapidly. The chart further sets forth that the amount of money made possible by the George-Barden and Smith-Hughes Acts is a very small percentage of the overall budget, but it has been over the years a very stimulating force in the development of programs.

Chart 11

The information conveyed in chart 10 shows that about 16.6 percent of the annual support of vocational education is derived from funds appropriated under the provisions of the Smith-Hughes and George-Barden Acts. Chart 11 indicates that of the total number of people who had advanced in their vocational programs so that they would be eligible for employment in 1956–57, 23.5 percent of them were placed in jobs outside of Kentucky. This shows that for this particular year the percentage of employment outside the State was greater than the Federal contribution to the program. This is indeed significant and proves that in the States where area vocational programs have been in operation, a contribution has been made to the skilled and technical labor market of the Nation as well as the respective States where the programs are located.

The chart further sets forth that of the individuals who had advanced in their training programs to the point of being qualified for employment, 62.5 percent of them have been placed in the skilled trade or related trade for which they had been trained. This high percentage of placement in the respective fields proves that the financial investment in the educational program has been sound. The proposed amendment to the George-Barden Act to provide $20 million for the

organization and continued development of area vocational programs throughout the Nation will, I am sure, add materially to the continued expansion and development of such programs.

At this point, I would like for you to recognize that the proposed amendment would also benefit materially agricultural as well as industrial development and, in the end, strengthen our program of national defense. Our experience in World War II should convince all of us that the ability to produce food and distribute it to the peoples of the world is one of our greatest weapons of defense. The gradual decline of the number of farms in the Nation as well as in Kentucky, the increase in acreage per farm, and the increased emphasis on mechanical farming make it imperative that people entering the field of agriculture be well trained. It is far more difficult to become established in farming because of the very nature of the capital investment and of the technical knowledge that is needed in order to make good. This cannot be done unless training opportunities are given on a basis that will meet the specific needs of the programs being organized. This amendment to the George-Barden Act would provide an excellent opportunity to have a large central farm shop in a county that would be equipped to do an effective job of the training of farm mechanics. It would also provide excellent opportunity to expand the adult and young farmer programs so that the individual farmer can keep abreast of the technical advancement in the field and the young farmer will have educational guidance in becoming established in farming.

We would also have to agree that upon the strength of the American home rests the real security of America. To break down America, we must first destroy the fiber from which strong homes and family life are built. In the years ahead, when more and more women are entering the labor market, the vocational home economics leadership throughout the Nation should develop area educational programs that would prepare women for the dual responsibilities that they are going to face in our society. The proposed amendment to the George-Barden Act would help materially to develop these types of programs.

Chart 12

In summary, chart 12 sets forth the advantages of the area vocational education program that the proposed amendment to the George-Barden Act would further develop within the States and, in so doing, further strengthen the foundation of our national defense:

1. Many shops can be established giving the students a wider selection of training.
2. Equipment comparable to that used in industry can be procured and maintained.
3. The enrollment of students will justify the employment of first-class mechanics as teachers.
4. Overtraining in any one area can be controlled.
5. Shops can be closed and others opened in line with the needs for training.
6. Training schedules can be made flexible.
7. It is less costly because 1 fully equipped shop can serve a greater number of trainees and be operated 11 months of the year.
8. Employers can more effectively cooperate with the area vocational school when in need of employees or when present employees need some specific training.
9. Special classes can be organized when needed. Extension classes can be organized in any section of the area covered by the area program center.
10. Such programs conform to the accepted standards of vocational education, including the quality and quantity of shop equipment necessary for an efficient training program. Work atmosphere can be fully provided, including work shifts, time clocks, industrial hum, and work experiences which are so essential when preparing young people to enter industrial and business employment.
11. More efficient administration and greater effectiveness of supervision at State and local levels can be provided.

Mr. GWINN. Mr. Patton, you did not go into the question, but do you expect to cover the fact of whether or not Kentucky can take care of this herself?

Mr. PATTON. No, sir; Kentucky cannot take care of it.

Mr. GWINN. Are you going to go into that?

Mr. PATTON. No.

Mr. GWINN. Why not, if she cannot?

Mr. PATTON. Because there is so much to go into that I cannot cover everything. Kentucky cannot take care of further expansion needs, because we are low in our per capita income.

Already Kentucky has about 58 percent of its budget going into education. If you will notice, a large percent, something over $800,000, of Kentucky's revenue is going into the area vocational program. We are doing the best we can. In eastern Kentucky, and throughout the State, according to your Department of Agriculture, over 56 counties have been regarded as critical from the standpoint of low per capita income. We do not have the tax resources to adequately meet the educational needs of our people.

Mr. GWINN. Do you have homestead exemptions in Kentucky?

Mr. PATTON. Well, to a degree; yes.

Mr. GWINN. It is quite a degree, is it not?

Mr. PATTON. No, sir.

Mr. PERKINS. $1,000.

Mr. GWINN. That means that possibly a $5,000 house is exempt?

Mr. PATTON. That is not necessarily true. It depends on the local assessor and the area in which it is located.

Mr. GWINN. Do you know, as a matter of fact, in the situation there, about the value of houses that are exempt?

Mr. PATTON. No, sir; I don't have that information. I am not qualified to speak on the subject of the assessed valuation.

Mr. GWINN. Do you know that your per capita percentage of income devoted to education is very low?

Mr. PATTON. I don't know that, sir.

Mr. GWINN. Compared to Tennessee it is something like a third, or was it last time we had the figures. Do you know that to be a fact?

Mr. PATTON. I don't have the comparative figures, no, sir.

Mr. GWINN. You do not have sales taxes devoted to this?

Mr. PATTON. No, sir; we have no sales tax. That is involved, somewhat, in politics in Kentucky.

Mr. GWINN. You do not offer that as an excuse, do you?

Mr. PATTON. I am not authorized to pass a sales tax.

We certainly believe that it would be a wise thing to do.

Mr. GWINN. If Kentucky wanted to raise its tax levies, and if it did away with its homestead exemption, which is something very few States have, and if it had a sales tax, it could take care of vocational education as in many States, could it not?

Mr. PATTON. All of those are assumptions, for future consideration. That is up to the Governors and our legislative bodies. But from the present outlook, as we see it, and from my experience of working in rural Kentucky, I believe we do not have the resources to tax. You cannot tax an income that does not exist.

Mr. PERKINS. Mr. Chairman, will the gentleman from New York yield for a correction?

Mr. GWINN. Yes, sir.

Mr. PERKINS. I must correct from New York on the statement about homestead exemptions in Kentucky. All property in Kentucky is taxed. The $1,000 which Dr. Patton referred to is exempt from debt as a homestead exemption, but not from taxation. On all real and personal property in Kentucky, the holder of that property pays taxes to the State and to the county governments.

Mr. ELLIOTT. I will ask the gentleman what is the rate?

Mr. PERKINS. The rate is about, over the State, I think, 40 percent of actual valuation. The assessed valuation is equivalent to about 40 percent or something in that vicinity. I am not certain because I have not been in close contact with it in the last few years. But that is about it.

Mr. BARDEN. Mr. Chairman?

Mr. ELLIOTT. Mr. Barden.

Mr. BARDEN. May I ask the gentleman a question? This part is not quite like a question, but it is more of a reminder. My friend from New York who was following a similar line of questions with the superintendent of education in the State of North Carolina, Dr. Carroll. He was asking him why he should advocate tearing Federal money down.

Dr. Carroll's reply was "Well, Congressman, I prefer to use my words and say to you that the Federal Government should either leave more money in my State with which to do the job, or divide with us."

So that turn of mind places some responsibility on the gentleman from New York and myself to try to remedy that situation a little bit. I am in favor of it.

Here is what I really wanted to ask: You gave us some figures with reference to the equipment you had in the State, which you used for that year, some $44,000. What would you say would be the average value of the equipment, including laboratory equipment, electronics equipment, mechanical equipment, and so forth, in the average vocational school in the State of Kentucky?

Mr. PATTON. For the State as a whole, for insurance purposes, a value of around $3 million has been placed on the equipment.

Mr. BARDEN. Does that just include the laboratory equipment?

Mr. PATTON. That includes the laboratory and the shop equipment. That is for insurance purposes.

Mr. BARDEN. In the vocational schools alone?

Mr. PATTON. That is right. In the 14 vocational schools.

Mr. BARDEN. And that has been the accumulation?

Mr. PATTON. That is right, since NYA days. We took over the NYA centers and took over their equipment.

It was deeded to the State, and when the war training program ended the equipment that was used for it was also deeded to the State. So that furnished the nucleus from which we started these area programs.

Mr. BARDEN. Does that valuation include the buildings in which the equipment is located?

Mr. PATTON. No, sir.

Mr. BARDEN. This is just equipment?

Mr. PATTON. This is just equipment.

Mr. BARDEN. That equipment as of the present date consists of surplus property, NYA property?

Mr. PATTON. That is right—war training property and surplus property we have since obtained.

Mr. BARDEN. Would you hazard a guess as to how much of that the State of Kentucky has bought outside, aside from the source of property which has been given to you?

Mr. PATTON. Not over a fourth, over the years.

The CHAIRMAN. Is this surplus property dwindling out at this time?

Mr. PATTON. The types of equipment we need are wearing out and much of it is out of date.

The CHAIRMAN. For instance, the only type of electronic equipment you get now would be the type of equipment that is to some extent obsolete?

Mr. PATTON. That is right, and industry has discarded it. We want efficient, up-to-date equipment so we can do an efficient, up-to-date job.

The CHAIRMAN. That is all I care to ask.

Thank you, Doctor.

Mr. ELLIOTT. May I call the committee's attention to the fact that we have seven more witnesses. The gentleman from Georgia, Mr. Landrum, is with us but has told me that he may have to leave; so I would like to vary your schedule a little bit, Mr. Mobley, and recognize the gentleman from Georgia, Mr. Landrum, to introduce Mr. Carlton, the director of the North Georgia Trade and Vocational School at Clarksville, Ga.

Mr. Landrum.

Mr. LANDRUM. Thank you, Mr. Chairman.

It is necessary for me to leave the committee shortly because I am a member of the Fair Labor Standards Subcommittee and I have to go to a conference with some people about the extension of coverage which comes under the jurisdiction of our full committee, as you well know.

If I had my personal preference I would much rather stay here and listen to a subject in which I am vitally interested and for which I have always had a great deal of genuine love and affection.

Down in Georgia we probably have given more real thought to vocational education than any other State, perhaps, except Kentucky, from whom we have just heard a wonderful presentation.

And I must take the opportunity to compliment Mr. Patton on the fine work he has done down there.

But from Georgia we have not only this gentleman that you give me the privilege of presenting to the committee, but the gentleman who is executive secretary of the American Vocational Association. He is a native Georgian who comes from Paulding County, Dallas, Ga., which is kind of like the place I come from. It is a place in the road but it has produced, you see, a man with a wide mind who really understands the problems of America, M. D. Mobley, and I am glad to claim him as a friend and join him in this program of promoting vocational education.

Down in northeast Georgia and the district I am privileged to represent, we have the North Georgia Trade and Vocational School, the plan for which was taken from the old district agricultural and mechanical school setup. Many years ago Georgia had a program of congressional district schools, agricultural and mechanical schools, where rural boys and girls went and worked their way through the high school, the general academic program with vocational phases accentuated.

When those schools were abandoned, various uses were applied to the plants and finally in this northeast Georgia section at Clarksville they came to establish this trade school.

We have had more directors than Mr. Carlton. But we have not had anyone who has enjoyed the degree of success that he has in the various fields which he will define to you that the school is active in.

I suspect that in relation to what we are hoping to acomplish with this section of the bill that this trade school is the nearest thing to an area setup that you would want to find. It is located so that boys and girls can be transported there if necessary. It has facilities for boarding, and administrative setup that takes care of both the girls and boys. It has presently underway about a $400,000 expansion program.

I believe that is about right; is it not?

Mr. CARLTON. $500,000.

Mr. LANDRUM. About a half-million-dollar expansion program financed by the State of Georgia, at which the present Governor and myself were present last fall when the ground breaking ceremonies were underway.

I can go on and on detailing the splendid accomplishments of this school and the wonderful possibilities that it has, because I am just full of it, and I love it; but I want the commitee to have the pleasure and benefit of Mr. Carlton's testimony, and so without further statement I take the greatest of pleasure in presenting one of the finest vocational directors of the vocation schools in America and a genuine personal friend, Mr. H. O. Carlton, of Georgia.

Mr. ELLIOTT. Mr. Carlton.

STATEMENT OF H. O. CARLTON, DIRECTOR, NORTH GEORGIA TRADE AND VOCATIONAL SCHOOL, CLARKSVILLE, GA.

Mr. CARLTON. Thank you, Congressman Landrum.

Mr. Chairman, you have my formal statement in which I attempted to give you a picture of the type of area school we are developing in Georgia.

We have two major objectives in establishing these schools. We have two in operation. I am going to speak of the North Georgia Trade School. It opened 14 years ago this past January.

One objective is to provide training in the skills for rural boys and girls of Georgia who live too far from any organized vocational program to commute and gain advantage of this type of training.

Second, in training program in vocational education, there are a variety of occupations that we call the rarer occupations, and we needed a central place where such training could be offered economically. They are the type of occupations that might require only 1 or 2 classes to fill the normal needs of an entire State.

Our school, as Congresman Landrum said, is at the present time in a half-million-dollar building program, the major portion of which will take care of electronics and related fields in a 40,000 square foot classroom building and shop building. A girls' dormitory will take care of the increasing needs for training women in industrial pursuits.

As soon as this building program is completed, possibly by next fall we are hoping that somehow we will be able to equip our new facilities.

At the present time we have roughly estimated that we will need at least $100,000 for the electronic equipment that is necessary for training in skills used in our space age. That is just one area of training.

We do not have actual figures on others because we are working on them at the present time.

I believe figures released by our State auditor indicate that at the present time in Georgia we are spending more than 50 percent of our total State income on education in all categories.

We have been dribbling in $10,000 and $15,000 per quarter on equipment—funds that the State could spare us—but this is not sufficient to keep up with the demands of industry.

We have had students from all over the United States coming to our school and we have served youth from several foreign countries, as special students under the Government program. We do have a great number coming from the Central States and some from New York. These students have found that we offer training in certain areas—for instance, in the dry-cleaning industry—that is not available in very many localities today.

We have enrolled more than 7,000 students in the 14 years of the school's existence. We can only handle from 475 to 500 students at any one time. Most of our dormitories house four students per room.

At the present time about 40 percent of our young people are high-school graduates, and that is good in our area because in this day and time the technology that they need requires a good sound academic foundation, comprehensive reading ability, and as much mathematics and scientific training as possible, especially in the realm of physics.

So it is becoming increasingly difficult for us to keep up with the times and we have calls for additional services constantly. We are right in the middle of an area that is developing atomic energy. Lockheed Aircraft is one industry that employs our graduates.

The Southern Bell Telephone just recently came to us and asked us to help with a training program for technicians to take care of the advanced telephone equipment that is being installed in rural as well as metropolitan areas. The Southern Bell manager spent a day in our school and wanted us to make available to his company as many men as possible who have worked in the field of electricity and electronics.

The personnel manager of Sears Roebuck's southern offices in Atlanta has asked for men in the electrical-appliance trades and in other trades necessary to this business.

Many of our graduates in radio communications are running radio stations in Georgia and other States today. A good many have gone into the Armed Forces where they are pursuing their careers in this field.

One of the things that gives me the most concern is the fact that for years we have had a tremendous waiting list for certain training programs—mainly in the defense areas. At times these lists include from 200 to 300 young men, and some young women who want to enroll for training. We put some of them off 6 and 8 months, waiting for space for them. We have to tell them that. And we need twice the space to meet the needs for training demands in our area alone.

We are running at the present time a little checkup on what our last year's graduates are doing and where they are. Just as I left I picked up I believe 47 cards that had been returned, and in checking them over I find that 12 out of the 47 are working in other States. We trained them in Georgia.

I firmly believe that if we give sufficient numbers of our young people skills and know-how the ingenuity of American industry, under the the guidance of our engineers, will keep us abreast of the technological developments of other countries and help preserve the liberty we love so well.

Our school is ready, able, and willing, as far as our supervisory setup is concerned, to meet expanded training needs. But I do not know whether it will be possible to get much more money from Georgia than we are getting now. So, for the present at least, we must face the fact that we can provide only on a limited basis the workers required for the industries moving into our State at such a tremendous rate.

Thank you, Mr. Chairman.

Mr. ELLIOTT. Thank you very much, Mr. Carlton.

The CHAIRMAN. May I inquire?

Mr. ELLIOTT. Mr. Barden.

The CHAIRMAN. Of course, you and I know that there are a tremendous number of boys who are now in the service who are in these vocational-training schools.

Mr. CARLTON. Yes.

The CHAIRMAN. And, of course, you are aware of the fact that the Defense Department is spending millions of dollars in advertisements to get them to go into these vocational-training schools.

Mr. CARLTON. Yes, sir.

The CHAIRMAN. My thinking is that with the experienced teachers, the program that has been developed over 50 years of experience, the vocational-training program as we know it cannot only do a better job, but at much less expense than the Federal Government can do it or the Defense Department can do it, if you had comparable equipment.

Mr. CARLTON. Yes, sir; I agree with you, Mr. Barden, and I might say that at the rate industry is moving into Georgia—even though I cannot speak for industry—I believe industrialists are realizing that we can do the job more economically through our organized facilities than they can by setting up separate training programs in their plants

The CHAIRMAN. So what we have now is this program that started back yonder. The intelligence of people in industry and in the Defense Department had the vision as this program developed that that was such a fine, useful, and indispensable type of training that they all would have to go into it. Not just millions of dollars but hundreds and hundreds of millions of dollars are now being spent in the Defense Department in doing identically the same thing that you are set up throughout the Nation to do and could do for I daresay 25 percent of the cost.

Now, something was mentioned a while ago about the apprentice-training program. I do not know how many millions are being spent in that program. I am not familiar with the budget on it.

Generally speaking, I am in favor of vocational training. But it seems to me that over 50 years' experience in developing a program is too valuable to be either cast aside or to permit others with less experience and less ability to put across the program to take over, so to speak, and because of the fact that they have available millions of dollars where you have thousands of dollars to approach the problem from a scatter-shot approach.

I wonder if you have given any thought to just how many competitors you have in your field, and that is exactly what it is. The apprentice program, the tremendous setup in the Defense Department, are just open competitors for the boys who want to go in and get this type of training.

Mr. CARLTON. Yes, sir. I have not given this, however, much thought. We have been, of course, working with the apprentice program in providing the technology that goes along with the operations in skills that enrollees are learning in the plants.

But we have found this: I guess some 50 percent of our students have been returned Armed Forces personnel, and many had specialized training somewhere in the Armed Forces, but they have found that it was not sufficient in breadth and sometimes depth to enable them to take over a job in industry that they would like. Therefore, we add to what they have had. We give them credit for that, and allow each student to progress at his own speed. He is matched against the skills and technology of the trade, not against the rest of the class or shop. If he has had certain areas through examination, he may try to complete his program at an accelerated rate.

The CHAIRMAN. My great interest in this is because this matter has come up and it is not just the school matter, so far as that is concerned. Were we not already spending, and I daresay that it is approximately $26 million—is it not, $26 million—that the Federal Government puts into vocational-training programs?

Mr. MOBLEY. It is about $30 million, including the Smith-Hughes funds.

The CHAIRMAN. Well, including Smith-Hughes. It is $26 million under the George Barden Act. That would not even be petty cash in what the Government is spending and it almost irritates me when I think about how ready we are to let somebody pick up a thing and make a glamorous situation out of it and spend billions on it, coming out of the Federal Treasury, just exactly like the $26 million is coming out; and how easy it is for us to overlook the established program.

The originators of the program setting it up are doing a fine job on just a small percentage of the cost. And we let these other things just absorb and move on. I do not like it.

Dr. Mobley heard me. This is not the first time.

Mr. MOBLEY. That is right.

The CHAIRMAN. I believe you did set up——

Mr. MOBLEY. We have a committee working with them now.

The CHAIRMAN. You will lose if you do not watch. I can tell you that right now.

Mr. MOBLEY. I am hoping, Congressman, we are going to find out what they are doing and I think we are getting somewhere.

The CHAIRMAN. I know too much about that, about what they are doing and what they are not doing, so far as that is concerned. But if a fellow goes in there, and this is not new to you.

Mr. MOBLEY. That is right.

The CHAIRMAN. If he goes in there and has had training in these technical schools, they are just as liable to take him and put him to doing something that he knows nothing on earth about and thereby waste what money has been spent on that program and that was the

thing that you told me was one thing you were very much concerned about in the establishment of this committee.

Mr. MOBLEY. That is right.

We are trying to get the Defense Department to recognize the training that these young people have had in vocational schools and place them in the area of work for which they are prepared when they get into the armed services. I am hoping that through the joint committee we established a year and a half or 2 years ago this, in time, will be accepted procedure.

Of course, when you are dealing——

The CHAIRMAN. Common sense ought to make them do it immediately without any argument.

Mr. MOBLEY. That is right.

The CHAIRMAN. I mean that is just something that anybody would know to do to utilize the skills that are available.

Mr. MOBLEY. That is right.

The CHAIRMAN. I do not advocate throwing the Defense Department out of vocational training. There may be some specialized, and very likely there are, I am sure there are some fields.

Mr. MOBLEY. That is right.

The CHAIRMAN. But for them to just wade in because of the billions—I do not know why it is but we fellows raise more sand over a few million dollars than a billion. Sometimes I think it is because I cannot count that high. We raise sand about the millions.

Mr. LANDRUM. Will the gentleman yield for an off-the-record comment?

The CHAIRMAN. Yes.

(Discussion off the record.)

The CHAIRMAN. You know out of that grows a very potent suggestion. I talked to our chairman and it is not out of his head that it would not be embarrassing for me to ask them to lay some things on the table here in this field. I just frankly think that it is time to check up. I am not willing to let it go along and to let it arrive at the point where the only place in America where a boy can get good vocational training would be in the United States Defense Department. I just think that is bad and I think it is dangerous.

Mr. MOBLEY. May I add that most of our Federal penitentiaries now have wonderful vocational setups. Are they then the best place to get good vocational training?

The CHAIRMAN. That would be one way. I do not recommend it.

Mr. MOBLEY. No.

Mr. PERKINS. Mr. Chairman.

Mr. ELLIOTT. The gentleman from Kentucky.

Mr. PERKINS. I regret that other official duties prevent my attendance here any longer this morning. But I cannot leave this meeting without complimenting Mr. Mobley and all of his corps of witnesses that he has brought here. I just wish that the American people could have heard the testimony here that has already taken place today.

I feel confident that the Congress will not stand idly by and permit the Federal Government to withdraw from this program at any future date. I feel like the Congress well recognizes that hundreds of thousands of families in this country have achieved a better standard

of living and especially in the rural areas on account of the vocational education program as that was first inaugurated by the Smith-Hughes Act and later expanded by the George-Barden Act. It certainly will be a sad day in this country when the Congress permits a recommendation from any source or from the Budget Bureau to destroy an efficient program, for the taxpayers in America are perhaps getting more value received from every dollar expended than from any other program that I am conscious of.

It is a pleasure for me to support this program in the future and I am hopeful that somewhere along the line we will be able to give some assistance in dividing necessary and essential equipment for the schools that so badly are in need at the present time in the various States.

That is all I have to say, Mr. Chairman.

Mr. McGOVERN. Mr. Chairman, since time is short I would just like to associate myself with the remarks of the gentleman from Kentucky, Mr. Perkins.

Mr. ELLIOTT. Thank you very much.

Without objection the statement of Mr. Carlton may be made a part of the record.

(The statement referred to follows:)

STATEMENT OF H. O. CARLTON, DIRECTOR, NORTH GEORGIA TRADE AND VOCATIONAL SCHOOL, CLARKESVILLE, GA.

THE SCHOOL

The North Georgia Trade and Vocational School is 1 of 2 State trade schools administered by the State department of education under the State board for vocational education. The North Georgia Trade School is located in the northeastern section of the State at Clarkesville, and the South Georgia Trade School is in the southwestern section of the State at Americus.

These schools were established with two main objectives in mind:

(1) To provide education in the skilled trades for students in rural areas who live too far from a trade or technical school to commute daily for training.

(2) To provide a place where training in the skills of the rarer occupations could be given on an economical basis. These are those occupations for which 1 or 2 schools in the State will provide sufficient skilled workers to supply normal requirements in the State.

(3) A third objective has been added in the last few years by the designation of the schools as area trade schools—this in addition to their function as statewide schools.

The North Georgia Trade School has a campus and farm area of 335 acres, with 2 dormitories, 8 shop buildings (including large and small), a gymnasium, and a housing project for married students with families. At present the school has under construction a new cafeteria and kitchen, girls' dormitory for 100 students, and an electronics building with an area of 40,000 square feet.

The farm produces beef and dairy products, poultry products, and some pork for use of the school.

The South Georgia Trade School has a building program including a girls' dormitory, an electronics building, and an automotive mechanics building. These new building programs at both schools will only partially meet the tremendous demand for training in the State.

THE PROGRAM

The North Georgia Trade School offers education in the skills of the following trades and occupations: Automotive mechanics, automotive body repair, bricklaying, cosmetology, drycleaning, laundry, electric-motor repair, electric-appliance repair, machinist trade, photography, practical nursing, radio and TV repair, radio communications, refrigeration and air conditioning, business education, shoe repairing, small air-cooled motor repair, watch, clock, and jewelry repair,

woodworking, and carpentry. The South Georgia Trade School has courses in diesel mechanics, aircraft engine, and aircraft mechanics. Of the above-named courses, those in automotive mechanics, the electrical trades, machinist, photography, radio repair and communications, business education, practical nursing, watch, clock, and jewelry repair, diesel mechanics, aircraft engine, and aircraft mechanics are considered vital in this area for national defense.

As soon as the building is completed and adequate equipment can be secured, the school is planning to greatly increase its offering in the field of electronics and instrumentation. This is a slow process since at present Georgia is spending better than 50 percent of its total revenue on education, and funds are not yet available to make outlays of this type except over a period of time.

Another course to be started immediately, as soon as funds can be made available, is medical laboratory assistant, to help relieve the shortage of these workers in the laboratories of the Hill-Burton hospitals in Georgia. This course is being set up at the specific request of the Medical Association of Georgia.

THE STUDENTS

The North Georgia Trade School has enrolled almost 7,000 students in the 14 years of its existence, and the South Georgia Trade School has enrolled almost 4,000 in the 10 years it has been operating. In the main, the students have been young people between the ages of 16 and 28 years, with approximately 50 percent of them young men back from the armed services and needing training for civilian jobs. The North Georgia Trade School, for the past several years, has maintained a waiting list of students wanting to enroll, but the school did not have adequate facilities to accept them. At times this list has gone as high as 200 young people wanting to get into the school. This waiting list has been in the areas that seem to be most vital to national defense at the present time; such as, machinists, electronics areas, radio communications, etc. The capacity of the North Georgia Trade School is at the present time approximately 500 students, and these students stay enrolled from 1 to 2½ years at the school. There is a growing demand by high school graduates for admission to the school, which cannot be met until additional facilities can be provided. Approximately 40 percent of our young people are high school graduates at the present time. Georgia has always been noted for its large population of young people, and it is becoming increasingly difficult to provide adequate facilities for training in the skilled trades for these young people who are not planning to live on the farm.

TRAINING FOR DEFENSE

The two trade schools in Georgia are located within very short distances of many defense installations such as Lockheed Aircraft Corp., atomic and hydrogen development installations, and many smaller plants making component parts of guided missiles, supersonic bombers, fighters, etc. Many of our graduates find their way into these plants and make a direct contribution to the efforts of our country to keep abreast in the race for survival, and victory for freedom and democracy. With the arrival of the space age, the technical aspect of various skills is constantly increasing and the schools, or somebody, must meet this demand for increased technical know-how. Along with the skills necessary to production in the various phases of our defense program, the necessity for more technology immediately brings about the problem of more space, more and costlier equipment, and instructors with greater knowledge of the technology necessary for this day and time.

In the area of radio communications, large numbers of our graduates are the operating engineers for radio stations in Georgia and surrounding areas, and many of them who have gone into the Armed Forces are serving in that same capacity there. The South Georgia Trade School has made a significant contribution to national defense by training 500 automotive mechanics for the Armed Forces.

THE NEEDS

The need for more and better skilled workers is rapidly increasing with the advent of more and more industry in the northern part of Georgia. Industry is asking for young men and women with greater background of vocational technical training in order to fit into advanced methods of manufacture and fabrication of goods. This is placing an increasingly severe strain on the resources of our trade schools, especially the area schools, to meet this demand of industry and of young

people wanting and needing this training. As stated above, the North Georgia Trade School has had a large waiting list made up of young people desiring to learn a skilled trade. Many of these young folks lose heart when we have to postpone their registration in certain areas for as much as 6 months, and do not come back but take some unskilled job in order to earn a livelihood for themselves. One of our greatest needs at the present time is for additional equipment and some additional housing for various areas of defense training which we are unable to institute due to lack of space. We estimate that it will take in the neighborhood of $100,000 to put in equipment necessary for minimum requirements in the electronics field. We believe that at the present time young people with salable skill and know-how will do a great deal toward relieving the slight recession which we hear so much about today. Vocational trade and technical education is of doubtful value unless it grows with the requirements of industry and the technology of our space age. To keep up requires more space, new types of equipment, and better trained instructors from year to year. As mentioned above, the State of Georgia is already putting more than 50 percent of its total revenue into education, and consequently the requirement for new buildings for trade training is slowed down due to the great pressure for funds for other State agencies.

In conclusion, I firmly believe that if we give our young people the skills and know-how in large enough numbers, the ingenuity of American industry and engineers will certainly be able to keep us abreast of the technological developments of other countries and help preserve the liberty we love so well.

Mr. ELLIOTT. I am going to vary your list again, if I may, Dr. Mobley, by saying that our next witness will be Mr. William Rasche, Director of the Milwaukee Vocational School.

So we have with us this morning the gentleman from Wisconsin, Mr. Reuss, who has appeared before our committee on occasions over the period of the past years and has demonstrated on many occasions his abiding interest in education in all fields.

I am going to recognize Mr. Reuss to introduce Mr. Rasche.

Mr. REUSS. Mr. Chairman, I appreciate the opportunity given me to sit in on the deliberations this morning, as well as the opportunity you are giving a distinguished fellow citizen of mine, Mr. William Rasche, to make a contribution to the hearings here this morning.

We in Milwaukee are very proud of our Milwaukee Vocational School, of which Dr. Rasche has been a director, for I believe more than a quarter of a century.

We are also very proud of Mr. Rasche, who has attained national recognition for his work in vocational education. I know that he will make a real contribution to your study this morning.

STATEMENT OF WILLIAM RASCHE, DIRECTOR, MILWAUKEE VOCATIONAL SCHOOL, MILWAUKEE, WIS.

Mr. RASCHE. Thank you, Congressman Reuss.

Mr. Chairman, as Congressman Reuss has indicated, I am Mr. Rasche of Milwaukee, and I am here representing our association because I feel that countrywide we have a very fine system of vocational education, and it would be unwise if we did not use it fully at times such as this.

I would like to talk to two titles of the bill rather than to try to restate what is in my statement. I am going to talk to title 12 and I am going to say a little bit about title 5.

Before I begin, however, I would like to have you, if you have it before you, look at the last page of my statement where you will find a picture of our first building, which was constructed at three different

times. It is a block long, a block wide, and 6 stories high. You will note a bridge at the right that crosses the street and that is connected with another building a block long. That building will be expanded to 4-stories. It is already at the 2-story level.

This is a municipal school in the sense that it is primarily supported by direct taxation in the city of Milwaukee. The replacement value of the whole plant, the two buildings, and the equipment, our business manager told me the other day, would represent about $15 million at current prices.

The school last year did business with over 30,000 people, although not all of them were housed in the two buildings downtown. We have the use of four other buildings in the city, including the Boys Technical High School, which is in the general school system.

The school was a big factor in Wisconsin during World War II. Over and above our regular enrollment, during the war period, we trained 36,862 civilians for jobs in war industries and also for supervisory positions.

I would like to say that this school has evolved over a 46-year period into what it is today. It really constitutes five types of schools. They are all housed within this big downtown plant, which we sometimes talk of as Milwaukee's vocational technical center.

There is the original continuation school for young workers who have not finished high school, but who have jobs and who attend school part time. That, our only compulsory group, constitutes 9 percent of our current enrollment which at the moment stands at about 16,022 people.

Then we have an apprentice school, and you are familiar with that type of program. We have 1,076 apprentices at present.

There is an adult high school for people who are trying to complete an education that was interrupted in their younger days. The enrollment is 823.

Then there are 10,747 enrolled in the adult vocational school—people to a large extent who are interested in extension training although there are others also who seek more general training.

The latest member of the family of schools is the Technical Institute, organized in 1951. In the week of February 7, it claimed 1,941 students, but, a week later the number had crossed the 2,000 mark—which is indicative of the pressure that is on in our community.

Now, deviating from my set statement, I would like to make these few points.

There is an international situation with which you are familiar and it has been discussed. We have rapidly rising enrollments because of the high, postwar birthrate. There is another point that I think is very vital. We cannot afford to waste any potential manpower in our States and communities in view of the international situation. And our vocational schools are ready to train the necessary forces.

I would like to point out that this school of ours in Milwaukee—I am just using it as an example—is one of the large operations in the country.

You have asked if we need help? The answer is we do, and I am going to point out the two respects in which we particularly need help.

I said that we are increasing the space in our new building—that is, we are going up two stories. The addition will cost $1,300,000. Our common council a month ago voted to sell bonds to the extent of $750,000. Our board has agreed in the next 2 years—1959 and 1960—to take out of its operation budget (which is limited to 2 mills on the assessed dollar) $350,000 in one year and $250,000 in the next to bring together the total amount needed.

Now, we are building this shell first. We will complete the third floor next year, and the year following we will finish the fourth floor. But there is not any money in sight to buy the equipment to put into that additional space as rapidly as we will need it. Therefore, I can agree with Mr. Barden in that even in a large center such as Milwaukee it would be of tremendous help if additional funds were available on a matched basis, as I think the bill contemplates, to help us get the scientific equipment and other technical equipment that we must have.

Now, then, I have one more point, and that is in regard to the area situation in Wisconsin. We have about 10 vocational-technical schools, 9 that are smaller than the Milwaukee School, in Wisconsin's larger cities. Each one of those cities is a focal point that attracts people from surrounding counties and other cities, where this type of training, particularly technical training, is not available.

The Milwaukee school at the present time is drawing students from 27 counties out of the 70 in the State of Wisconsin. It also has students from 3 States and 14 other countries.

About 7 percent of our enrollment is nonresident, which shows we do offer area service. We charge nonresident students a tuition rate that is limited to $1.50 a day by our State legislature. But that rate is not sufficient to cover the actual cost of training these students. On the other hand, many people in rural communities and in villages find it difficult to pay that much tuition when they come to our city.

For your information, on the 27th of this month an educational committee of our legislation will meet in Milwaukee to consider this problem.

But it is too bad that there are thousands of other people in the State who would like to enroll for training who cannot because they do not have the money to pay even at that low rate.

It would help us to help them if title 12 funds were available. We would, of course, work through Milwaukee, Mr. Barden, but we could extend our services considerably if we had additional funds. If we had more Federal funds and additional funds from our State—which I think we are likely to get—our tuition rate could be brought down so that many of those people who cannot now afford training could enroll.

Now, that in essence is a brief account of our needs and our current position.

But I know Milwaukee will do its part because of all the moneys we now receive only about about 4 percent comes from State and Federal aid and the rest comes from taxpayers of Milwaukee as Congressman Reuss very well knows.

Thank you.

Mr. ELLIOTT. Thank you very much, Mr. Rasche.

And your prepared statement may be made a part of the record at this point.

(The statement referred to follows:)

STATEMENT IN SUPPORT OF PARTS OF H. R. 10381 BY WILLIAM F. RASCHE, REPRESENTING THE AMERICAN VOCATIONAL ASSOCIATION

STATEMENT ON H. R. 10328

My name is William F. Rasche and I am here to testify on parts of H. R. 10328 as a representative of the American Vocational Association. I am also the director of the Milwaukee vocational and adult schools.

H. R. 10328 is a bill which makes provision for strengthening the national defense and includes support for vocational and technical education. I am registering in favor of such support.

Vocational and adult schools such as we have in larger centers of Wisconsin are particularly well adapted to develop skilled tradesmen, technicians, and supervisory personnel for war industries and the military services. During World War II the Milwaukee vocational and adult schools prepared 36,862 civilian people for such services, over and above the usual yearly enrollment, at the request of the Federal Government. This was accomplished by the continuous operation of the school plant on a 24-hour-per-day basis during part of the war period. The vocational school, as organized and administered under existing laws, is ready today to meet a similar emergency.

The Milwaukee vocational and adult school system consists of the five types of schools listed below. The enrollment of each is given as of February 7, 1958.

Apprentice school	1,076
Technical institute	1,941
Adult high school	823
Adult vocational school	10,747
Continuation school	1,435
Total enrollment of the 5 schools	16,022

THE VOCATIONAL AND ADULT SCHOOLS SERVE RESIDENT AND NONRESIDENT STUDENTS

The student body of the several schools is composed of both residents and nonresidents. Thus, for example, the technical institute has students in attendance from 27 Wisconsin counties, 3 States, and 14 countries. Of its 1941 students enrolled in February, 135 were nonresidents.

MILWAUKEE'S TECHNICAL CENTER IS LOCATED IN DOWNTOWN MILWAUKEE

The operations of the 5 schools are located in 2 large downtown buildings, each occupying a city block. One is 6 stories high and the other, with 2 operating floors now in use, will soon be expanded by the addition of 2 more stories. The 2 buildings are connected by a bridge at the 2-story level and a subway under the street which is between them.

The replacement value of the 2 buildings and their equipment is approximately $15 million.

The board owns other land in two adjacent blocks to accommodate future expansions when needed.

THE SYSTEM'S CHIEF FINANCIAL SUPPORT COMES FROM LOCAL PROPERTY TAXES

The 1957 budget for the system was $3,483,700. Of this amount, $2,969,146 was raised through a local tax levy. The Federal Government provided $67,413, and the balance came from State aid, nonresident tuition, fees, registrations, and other miscellaneous items.

ENROLLMENT PRESSURE IS CREATING DIFFICULT PROBLEMS

Milwaukee's school enrollment is increasing rapidly in the general schools. This increase is also reflected in the larger number of students enrolling in the vocational board's technical institute division. In 1954 the institute enrollment was 1,516. As indicated above, on last February 7 it was 1,941, an increase of

28 percent. This is but the beginning of the greater enrollment that will follow.

MORE SCIENCE FACILITIES ARE NEEDED

To complete the technical building will cost $1,300,000. All this money must be raised locally. The common council will provide $750,000 of the sum needed through the sale of bonds and the board will provide the rest out of its 2-mill tax from which it also receives its operation funds. It cannot raise the additional $550,000 in 1 year. It will, therefore, raise $350,000 in 1959 and the balance in 1960. It will not have enough funds to equip all the new science laboratories that are to be located in this building as soon as they are needed. Federal assistance as proposed in title V of the bill under consideration will help expedite the development of these urgently needed science facilities.

Similar needs are developing in other schools of our State and unquestionably also in the schools, institutes, and colleges of other States. The importance of such facilities in the education of technicians, apprentices, and specialists seeking extension training should not be underestimated. The rapidly increasing enrollments and the urgency created by the international situation make imperative the rapid development of science facilities in our schools at all levels.

APPRENTICE TRAINING IS ALSO IMPORTANT

Apprentices in Wisconsin are indentured by the industrial commission. They learn trades in the shops and laboratories of their employers and attend vocational schools 4 to 8 hours per week to secure related training in science, mathematics, trade technology, blueprint reading, trade codes, etc. Their usual apprentice term is 4 years. Minimum school attendance is 400 hours. In some trades it runs as high as 720 hours.

This program has been developed by the commission with the aid of advisory committees on which educators, management, and labor are represented. This system has been in force for almost a half century and is very successful in developing a highly efficient work force. In Milwaukee most trades require a high school education as a prerequisite to entering an apprenticeship.

Apprentices in Milwaukee work in over 40 different major occupations. Each occupation has its own advisory committee. In 1954 the number of apprentices on school assignments was 952. On last February 7 the enrollment was 1,076. This was an increase of 13 percent.

EXTENSION TRAINING IS ALSO SIGNIFICANT

A more informal training is acquired by adult workers who attend evening classes to secure extension training while employed. In periods of unemployment such workers also attend day classes. The adult attendance in day and evening classes exceeds that of apprentices and institute students combined. The upgrading accomplished in extension classes in Milwaukee contributes greatly to the skill and efficiency of workers. Similar results are obtained in other Wisconsin schools.

APPRENTICE, EXTENSION, AND TECHNICAL TRAINING ARE THE KEY TO EFFECTIVE INDUSTRIAL DEFENSE

The combination of appretice, extension, and technical training enables industry to develop its manpower resources effectively. This has been proven often in industrial cities which provide such programs. Need exists to reach out to the larger areas surrounding such cities. Our States are just beginning to give consideration to area schools. As yet not all the potential manpower that could be interested is availing itself of vocational education opportunities in the larger cities. Cities accept nonresidents on a tuition basis. Usually the tuition does not cover the full cost of the training provided. Even so, it is often too high to attract those who should avail themselves of the instruction they need. Undoubtedly at some future time the financial problems involved in this dilemma will be resolved. The provision made under title XII would for a period of years provide the stimulus needed to accelerate the development of area schools in the States. It would be a means for greatly increasing the work force needed for defense purposes and, as a byproduct, would help fortify many young people now living on farms and in villages who ultimately will be migrating to the cities to obtain employment.

Therefore, I believe the Federal Government would do well to provide such assistance as is proposed under title XII of this bill.

WORLD WAR II PRODUCTION TRAINING

TRAINED MEN AND WOMEN FILLED THE GAPS OF DRAFTED WORKERS

When industry was in need of trained workers during the war, and needed them quickly, the vocational school, in cooperation with the Government, inaugurated training programs to fill the need for war production workers and specialists for the Army and Navy. A total of 36,862 workers were trained in courses that were pointed toward upgrading those in the field. New workers were supplied to step into the depleted ranks caused by the draft.

Twenty-seven industries were served. Many sent their personnel in shifts to take short courses in shop mathematics, blueprint reading, inspection, and testing. Courses were given in auto and diesel engine mechanics, aircraft mechanics, electricity, foundry, machine shop, sheet metal, and welding to both men and women.

Women filled many classes and came from their supper dishes to run machines at night. The school was kept going on a 24-hour basis in order to help the industries meet the quotas set by the War and Navy Departments. Those who never handled a machine or micrometer learned to become industrial workers. Their contributions were spurred by patriotic enthusiasm.

During the war, close cooperation existed between the United States Armed Forces Institute and the vocational school; and throughout Wisconsin, all vocational schools located in industrial centers trained large numbers of workers to keep war production rolling.

Veteran training

The flexibility of the vocational curriculum was again tried and tested, and not found wanting, when it met the onrush of veterans returning from the wars with training programs designed to fit them again into the economic life of Milwaukee. These programs were approved by the Veterans' Administration. Ten thousand nine hundred and five veterans availed themselves of these courses between 1945 and 1949, and many were placed in gainful occupations through the placement department.

Mr. ELLIOTT. Mr. Emmett O'Brien, chief of the bureau of vocational education, State department of education, Hartford, Conn., is our next witness.

You may proceed, Mr. O'Brien.

STATEMENT OF EMMETT O'BRIEN, CHIEF, BUREAU OF VOCATIONAL EDUCATION, STATE DEPARTMENT OF EDUCATION, HARTFORD, CONN.

Mr. O'BRIEN. Mr. Chairman and members of the committee, my name is Emmett O'Brien. In addition to being the State director of vocational education in Connecticut, I am also president of the National Association of State Directors of Vocational Education.

I think you might be interested in my educational background. I was born and raised in Natchez, Miss., and graduate from high school there, and then went to prep school at Phillips Academy at Andover, Mass., and then to Yale, where I graduated in electrical engineering.

My experience in education includes several years of teaching in general high schools, 12 years as director of a trade school in New Haven, and 12 years as State director of Connecticut.

I have had about 18 years of experience in industry, part of it working in a factory at night while I went to Yale, and from that through various categories. At one time I was general manager of a moderate-sized manufacturing plant.

I provided a folder for the members of the committee—this green-covered folder—and in it is the statement I prepared for this hearing, a report of a statewide survey on the need for technical insti-

tutes in Connecticut, a bulletin entitled "Education for Industry," which describes our vocational technical schools (and I call your attention to the terminology we use, "education for industry," rather than training for industry), and a leaflet describing an area vocational agricultural program which is going to go in operation in the town of Rockville this fall. Also, you will find a list of several of the consulting committees that we work with. This illustrates the high caliber of the people who help us in developing these programs.

I also brought something else along and, in view of some of the comments that have been made, I think the chairman, Mr. Barden, might be interested in looking at it. Here is a State-built school that has been in operation for 3 or 4 years in the city of Waterbury, Conn., and I think these pictures show the type of equipment needed in a modern vocational technical school. This equipment alone cost us $600,000 and, if you will look at the variety, you will understand why it costs so "doggoned" much to really provide a program that is sufficiently modern and up to date to do the highly technical things that we have to do today.

I want to comment on 3 types of area schools that have been developing in Connecticut: The area vocational schools, of which we have 14, the technical institutes, and the vocational agricultural center.

In connection with the vocational techincal schools—those are regional schools—we also have a mandatory transportation act on the books which means the transportation of any young person in the State of Connecticut who wishes to attend the vocational school must be provided by the local community and the State reimburses the local community up to 50 percent of the cost. There is no geographical limitation and no tuition. A boy from any town can go to any school.

Some years ago, when considering the development of these schools (I think vocational schools in this country have too frequently used facilities such as abandoned elementary school and old factory buildings), we undertook a survey and then sought counsel from a committee of top-level people—representatives of top management, organized labor, education, public service, and other fields. Before we presented our proposal to the State board, we completed research, made a report, and gave it to this statewide committee to consider. As a matter of fact, I think the names on one of those lists that I gave you include the names of the present members of that committee.

As a result, we undertook a 10-year building program, starting in 1949 and continuing through the 1957 session.

The State of Connecticut appropriated $32 million for the modernization of our vocational schools. At the opening last week of a special session which is now going on in the State, the Governor recommended an additional $9,714,000 to carry on further development. Incduded in that was appropriation for an additional technical institute.

We have operated 1 technical institute in Hartford for about 10 years. It has been very successful. It has been accredited by the Engineer Council for Professional Development. The membership of that council are the major engineering societies.

In addition to that all-day program, we have within the last 3 or 4 years under pressure of requests from industries, developed a statewide group of programs on the adult level and on the technician level to assist in speeding up the technical preparation of workers already employed in industry.

At present we are planning and have acquired a site for a $3 million school in Norwalk, Conn. Equipment will cost $561,000 for that 1 technical institute.

Mr. ELLIOTT. How many students will it accommodate, do you know?

Mr. O'BRIEN. It will accommodate, full time, 600 students and, we estimate, anywhere from 2,000 to 2,400 part-time students—evening, afternoons, and other times.

Mr. ELLIOTT. Would a fair rule of thumb be that it takes $1,000 worth of equipment for 1 student in training?

Mr. O'BRIEN. I never tried to figure it that way, but that would be correct. For instance, at the Waterbury School I mentioned, illustrated in the folder you have there, enrollment is about 600 and equipment cost $600,000.

Mr. ELLIOTT. And the new building you are getting ready to build will accommodate 600 people and cost $561,000; is that right?

Mr. O'BRIEN. That is right.

I think that the technician survey, if you have time to glance through it, will interest you, because it was made primarily by people in industry, working with local manufacturers' organizations. Most of the interviewing in terms of factfinding that is covered in that report was handled by people assigned from the personnel departments of industry to make personal visits in collecting the information. So, this is not an educator's report so much as it is a report from industry on the need for technical institutes in Connecticut.

As you will notice, they recommend that in the next few years we build at least 6 (since the report was made the figure has changed to 7) regional technical institutes to serve the State of Connecticut.

One other feature of our area school program has been the development of vocational agricultural centers.

We made a careful study a few years ago and called together a statewide committee consisting of people like the dean of agriculture at the university, the commissioner of agriculture, representatives of farm organizations, and the like. In the 1955 session, our legislature passed an enabling act which provided for the construction of a complete, up-to-date farm shop in a rural high school. As a training center, that school serves anywhere from 6 to 10 towns, accomplishing the purpose of good area school development; concentrating modern facilities in one place rather than duplicating them in a lot of places, and providing one staff for several areas in order to conduct a modern program.

This new agricultural training center, located in Middletown, Conn., has been in operation about a year and a half. Already it has succeeded beyond our expectations. The enrollment went from a dying class with 1 instructor to 3 instructors for highly selected students. It is the center of activity in that area for farm-group meetings, and the Extension Service holds a lot of their demonstrations there. For the rural people of several communities it is a well-equipped center

where they can meet, put on demonstrations, and do all the things that are of interest and help to farmers.

I would like to close my statement by saying this: I think, as I have indicated, the State of Connecticut and the people of the State have been very generous in providing funds for and supporting vocational education. But I would like to say in my own official capacity and as a result of my experience that Federal funds are important to Connecticut. I am sure there are a lot of things in terms of development that I have been describing that just could not have come about without the assistance of Federal funds. In spite of Connecticut's ability and interest, there are areas where we are limited. Again speaking in my professional capacity out of about 24 years of experience, I think Federal funds, aside from directly helping local community and States, serve as a catalyst and a coordinating arrangement through the United States Office of Education. It amounts to a nationwide exchange of good practices and ideas. I just do not believe this could be accomplished in any other way except through the existence of Federal funds and the existence of the vocational division of the United States Office of Education.

I would like to close my statement with a story that comes from my boyhood in Mississippi that I think most of you gentlemen will appreciate. It is a story about an old colored gentleman going down the road driving a mule. The mule balked and Rastus tried to get him to go. He pulled his ears and twisted his tail, and the old mule wouldn't budge.

A doctor came along in his buggy and stopped and said, "What's the matter, Rastus?"

He said, "I can't get this here mule to go."

"I think I can help you."

He took out his satchel and got a hypodermic and squirted something in the mule's rear. The old mule twisted his tail, threw back his ears, and was out of sight up the road in no time at all.

Rastus looked around at the doctor and said, "How much did you squirt in that mule?"

The doctor said, "About 15 cents' worth."

Rastus said, "Squirt about 30 cents' worth in me. I got to catch that mule."

The point I want to make is that because of sputnik we know we have to do some catching up. I think the mulepower is there in our States and our organizations and our staffs, but this hypodermic of Federal money can speed up the results.

Mr. ELLIOTT. Thank you very much, Dr. O'Brien.

Your statement may be made a part of the record at this point.

(The statement referred to follows:)

STATEMENT IN SUPPORT OF ADDITIONAL FUNDS FOR VOCATIONAL EDUCATION AND PARTICULARLY IN SUPPORT OF S. 3187 AND H. R. 10381; TITLE XII

My name is Emmett O'Brien. I am State director of vocational education in Connecticut; I am also president of the National Association of State Directors of Vocational Education.

I was born and raised in Natchez, Miss., graduating from high school there in 1908. I graduated from Phillips Academy, Andover, Mass., in 1910 and from Sheffield Scientific School, Yale University, with bachelor's degree in electrical engineering in 1914. I have done graduate work at Yale and at New York University.

I have had 18 years of experience in business and industry ranging from machine operator (at night while attending Yale) to general manager of a moderate size manufacturing concern.

I was a classroom teacher in a general high school for several years, director of Boardman Trade School in New Haven for 12 years, and have been since March 1946, director of the division of vocational education, State Department of Education, Connecticut.

I am appearing at this hearing as an educator with 27 years of experience, as a member of the American Vocational Association, and as president of the National Association of State Directors of Vocational Education. My particular purpose is to provide information regarding the development of area type schools in Connecticut. These are vocational-technical schools (trade schools), technical institutes, and vocational agriculture area centers.

PHILOSOPHY OF VOCATIONAL EDUCATION IN CONNECTICUT

The underlying purpose of vocational education is to provide programs which prepare the individual for specific areas of occupational life, to upgrade and increase technical knowledge and skill of those already employed, and to provide technical and related information in instructional programs to individuals serving apprenticeships in various occupations. Such programs are an integral part of the educational opportunities provided to the citizens of the State, and are designed to meet the needs, aptitudes, and interests of individuals who desire such programs. In all programs the purpose is to educate as well as to train. The underlying philosophy is to educate for: (1) Earning a living; (2) active, constructive citizenship; (3) social competence.

REGIONAL VOCATIONAL-TECHNICAL SCHOOLS IN CONNECTICUT

As early as 1903 the Connecticut General Assembly directed the Governor to appoint a commission to investigate "practical means and methods of industrial and technical education." As a result of the work of this commission and other developments and by legislative action the first "State trade schools" were established in 1910 at New Britain and Bridgeport.

The original legislation stressed that: Such schools were to be open to all residents of the State; they were to be regional or "area" in character; they were to meet certain standards established by the State board of education.

Since 1910 there have been established 14 regional vocational-technical schools. (Note: In 1945 the names of the schools were changed from State trade schools to vocational-technical schools. This change was made as a result of strong suggestions from industry.)

The original method of support was for the town in which the school was located to provide the building, maintain it, furnish heat, light, and power and pay for one-half of the janitorial services. Due to the dispersal of population, the extending regional character of the school's services, and the need for expansion and modernization, the State board of education and the Connecticut General Assembly decided that the function of such schools, because of their regional character, had become a State function, and that it was no longer fair or feasible to expect a local school district to provide such facilities.

Accordingly, in 1948, the State board of education proposed, for the vocational-technical schools in Connecticut, a 10-year building program in which the State would build modern, up-to-date buildings, well equipped, and staffed and that the State would assume all costs of building, equipment, and operation.

Since then and including the 1957 legislative session, approximately $32 million has been appropriated for this purpose; 7 of these new buildings have been erected and are in operation, 2 are under construction, and 4 are in various stages of planning (1 of these, a $5 million, school for Hartford will be contracted for in June of this year).

Additional funds for the further development of this program will be requested in the 1959 session of the general assembly.

It is of importance to note that before this program was officially acted upon by the State board of education or by the general assembly, it was critically examined by a statewide committee of top-level representatives of industry, organized labor, school officials, and other representative citizens. This committee recommended the adoption of the program as essential to the economy of the State and a justifiable investment of public funds.

It is also of major importance to note that prior to the adoption of the large building program, and indeed making such modern facilities necessary, there was a reorganization of the instructional program in the light of technological advances, social change, and the need for greater competencies in modern industry. In these new schools there are modern science laboratories, adequate libraries, carefully designed and well-equipped shops, recreational facilities, food services, and other facilities necessary to a modern educational program.

It was intended that these facilities should reflect Connecticut ideas as to the dignity of skilled labor; the importance of industrial education in the economy of the State and that they should be well located, dignified in appearance and design, functional, to serve the purposes of the program.

Instruction in the day trade preparatory program in the 14 regional vocational-technical schools is provided in 30 trades with present enrollment of approximately 6,000, and extension services to adults and apprentices of approximately 10,000 persons.

The program of studies in the day trade preparatory program provides for instruction in English, mathematics, science, social studies, health and physical education, and shop. Fifty percent of the student's time is given to trade instruction and related theory, and 50 percent to general education.

On the State administrative staff, specialists in science and mathematics, general education, Audiovisual techniques of instruction, curriculum development, and technical subjects are provided to supervise, develop, evaluate, and maintain high standards of instruction.

In accordance with a State statute, transportation to these regional vocational schools must be provided by local boards of education to all-day trade preparatory classes for persons under 21 years of age. The State reimburses the local district for 50 percent of the cost, up to a maximum cost of $300 per year per student.

In the seven new vocational-technical schools now operating in the new and modern facilities there has been:

Increased respect for the educational program from industry, labor, school officials, and the public.

Improvement in the educational program made possible by modern facilities, functionally designed.

Improvement in quality of students desiring to enter these schools to prepare for entry into the skilled trades.

Improvement in quality of instruction for adults and increased use of facilities by adults desiring to upgrade their knowledge and skill.

In concluding the portion of this statement relative to the modernization of the vocational-technical area schools in Connecticut, it is important to emphasize that many citizens of the State have contributed to and taken a direct part in these developments. Through statewide committees, local consulting committees, special craft committees, joint apprenticeship committees, representatives of industry, labor, school and public officials, the State labor department, the Connecticut State Development Commission, and other citizens have worked with the professional staff of the State department of education with constructive help, advice, and criticism—all with one purpose—to provide an educational program which will assist in the development of Connecticut's primary natural resource—the skill and know-how of its citizens.

TECHNICAL INSTITUTE DEVELOPMENT IN CONNECTICUT

A technical institute may be defined as a postsecondary institution whose curriculums (1) are of 1 to 3 years' duration, (2) are technological in character, and (3) emphasize understanding and application of scientific principles more than manual skills. A technician in industry is a person trained in the application of mathematics, science, and technology for occupations of a technical nature lying between the skilled craftsman and the graduate engineer.

In the advancement and development of technology, experience has shown that there are many technical jobs which can be done by the technician, under the direction of and as an assistant to the engineer. Developments in industry show that the ratio of technicians to engineers is increasing.

Because of increasing needs for technicians in industry and expressions of need by industry for the training of industry, the Connecticut State Department of Education, in cooperation with industries in Connecticut, made a study of such needs and published the report of this study in February 1957. This document

is entitled "Technicians for Connecticut Industry," a study of need for technical institutes. Copies of this report will be filed with this statement.

Connecticut has operated under State auspices a technical institute in Hartford since 1946. Any person in the State is eligible to attend this institute if he shows evidence of ability to do the work required. Requirements for admission are graduation from high school, vocational-technical school, or evidence of ability as determined by examination. Experience has shown that students who have a good foundation in mathematics and science have the best chance for success in the technical institute.

The State technical institute in Hartford was accredited in 1955 by the Engineering Council for Professional Development. Membership in this council is composed of the major engineering societies.

The institute in September 1957 was able to admit, because of limited facilities, only 1 out of 4 applicants. Graduates from the institute are in demand by industry and reports from industry are highly gratifying as to the high grade of performance on the job.

In addition to the full-time, 2-year program the institute also provides an extremely valuable service to industry in the evening adult and extension program.

The technical institute instructional program is intensive in mathematics and science with particular application to the technology in the special areas. The course is terminal in nature, designed to prepare for technical work in a particular area, and is not designed to prepare the student to go on to a 4-year engineering college. However, some graduates do go on to engineering colleges and are given partial or full credit based on individual ability or accomplishment and the requirements of the particular college.

For the last several years due to specific needs and requests from Connecticut industry the State has been developing technician level courses in adult and evening programs, using the facilities of its statewide area vocational-technical schools. During the fall of 1957 approximately 2,000 persons were enrolled in these classes.

Because of the growing and rapidly accelerating need for the training of technicians, and based on the statewide study carried on in cooperation with industry referred to above, the State board of education supported by the Connecticut Development Commission and by industry has proposed the development over the next several years of additional technical institutes.

A wing of the new building in Hartford, expected to be under construction this summer will provide new and modern facilities for the present Hartford State Technical Institute. The Connecticut Legislature in 1957 appropriated $2,984,000 for a new technical institute at Norwalk. It is of major interest to note that the equipment for the Norwalk Technical Institute will cost over $500,000. The Connecticut Legislature will be requested to consider appropriations in the 1959 session for additional technical institutes.

By the modernization of its vocational-technical area schools, by the development of area technical institutes, and by the continuous development and improvement of Engineering School of the University of Connecticut the people of Connecticut are providing education for its citizens and support for its industry which will provide the technical skills and knowledge which are vital to our State and to our Nation.

VOCATIONAL AGRICULTURAL AREA DEVELOPMENT

Since 1917 vocational agriculture classes have been conducted in high schools in the State. In most areas local boards of education have been unable or unwilling, because of constantly increasing demands on their resources, to provide adequate facilities for such programs.

Several years ago a State consulting committee on vocational agriculture was organized. This committee was composed of farmers, representatives of farm organizations, the commissioner of agriculture, the dean of the school of agriculture, representatives of high school principals and school superintendents, and others. This committee after careful study proposed to the State board of education and that board approved the development of regional agriculture centers at carefully selected high school centers in the State.

The 1955 session of the Connecticut Legislature passed an enabling act and appropriated funds for the first center—now in operation at Middletown. The 1957 session appropriated funds for another center which will be located in the town of Vernon. Additional centers will be requested in the 1959 session.

The legislation provided for the approval of such centers by the State board of education. It provided for building and equipping modern farm shops, laboratories, greenhouse, classrooms, and other facilities, the cost to be borne by the State. It also provided by formula for paying "the excess costs of vocational agriculture education including adult and young farmer programs" and also to assist towns sending students to this center by paying part of the tuition costs. Such centers serve a number of towns. Mandatory legislation requires towns to pay transportation of full-time students, with 50 percent reimbursement from the State up to a stated limit.

Results of the operation of the center at Middletown during the last year and a half have exceeded expectations. The center, in addition to serving its purpose for vocational agriculture instruction has become a center for farm meetings, demonstrations, etc., in cooperation with the Agriculture Extension Service.

Those responsible for this development are convinced that such a development of area vocational agriculture centers is more efficient, more effective, and less costly by providing such services for citizens over a larger area, rather than having smaller, inefficient, and inadequate programs and facilities provided by one local community.

IMPORTANCE OF FEDERAL FUNDS IN SUPPORT OF VOCATIONAL EDUCATION

It will be seen from the foregoing statement that Connecticut people are vitally interested in providing good facilities for the education of its people, and have supported vocational education because of its vital contributions to the welfare of its citizens.

However, I would like to state my strong convictions, as a professional person, that Federal funds, even though small in proportion to total expenditure, have been and will continue to be of importance to vocational education in Connecticut. They are even more important to the Nation as a whole.

I am convinced that many of the important developments in vocational education in Connecticut would not have occurred except for Federal funds. (Please note that I am stating "would not have occurred," not "would not have been possible.") Federal funds, by making possible the maintenance of minimum standards nationwide, have contributed to the quality of vocational programs. They have provided through and with the machinery of the Vocational Division of the United States Office of Education a means and a catalyst for cooperation between the States and the dissemination of good practices and the development of ideas. They have made possible in the States the maintenance of State staffs whose primary purpose is to assist local schools and local communities in specialized programs in the preparation of individuals for economic independence because of the possession of salable skill and knowledge. In doing this the individual, the State, and the Nation are strengthened.

In times such as the present when the safety of this Nation depends on the productive capacity and strength of our people, when we have a defense budget of $40 billion, it is extremely difficult to understand how anyone who has any knowledge of the importance of education for productive skills can suggest the reduction of funds in support of such activities, rather than strengthening them and doing everything possible to improve them.

It is my conviction as a citizen of these United States that the Congress in its consideration of legislation which will best serve the interests of our people should keep well in mind that designs, ideas, and developments which are produced by engineers, scientists, and others must be produced, serviced and distributed, by millions of our people possessing the necessary skill and knowledge. Such are the people who receive this knowledge and skill through our national vocational education programs. They, too, are vital to our national defense and to our national economy.

The CHAIRMAN. Let me just ask you this:

Do you have students enlisted in your schools that have been through the service schools?

Mr. O'BRIEN. I would find that hard to say. I don't know.

The CHAIRMAN. Have you visited the service schools?

Mr. O'BRIEN. No, I have not.

The CHAIRMAN. I recognize the necessity for these people that we now consider training. There is no question in my mind about the need. There is some question in my mind about the economics employed and the commonsense used——

Mr. O'BRIEN. I will agree with that——

The CHAIRMAN (continuing). In arriving at this goal that I am interested in. Thank you, sir.

Mr. O'BRIEN. I might just say I have heard some comments from people who have visited the service schools in terms of the ratios of instructors to students in comparison with what we do and do efficiently. In addition, I understand they have more elaborate equipment than we could consider necessary under the same circumstances. That is about my comment.

The CHAIRMAN. There is not any place for the State government or the Federal Government to get money except from the people.

Mr. O'BRIEN. That is right.

The CHAIRMAN. It does not make sense, if we really have the interest of the people, to go ahead and take up with a wholesale situation where it costs 3 or 4 or 5 times as much to give that boy what the Government needs and what the country needs.

Again I qualify that statement by saying I recognize the need for some of it. But I think that the success that you gentlemen have made of this program and its popularity has had considerable to do with some folks' desire to raid you.

Mr. ELLIOTT. Our next witness is Mr. Rex H. Smelser, director of the Sowela Vocational Technical School, Lake Charles, La.

Mr. Smelser.

STATEMENT OF REX H. SMELSER, DIRECTOR, SOWELA VOCATIONAL TECHNICAL SCHOOL, LAKE CHARLES, LA.

Mr. SMELSER. Thank you, gentlemen.

Mr. Chairman, I would like to read my statement.

The CHAIRMAN. Let me say this. I must apologize. I am like most of these Congressmen. I need to be in three places at once.

Mr. SMELSER. May I answer the question you just asked him?

The CHAIRMAN. Yes.

Mr. SMELSER. Before I go into my statement?

The CHAIRMAN. Yes.

Mr. SMELSER. There is an FAC base near my school, and I hate to say this, because those boys might be kept from coming to school like they have been doing, but they go off to service school and then they come back and take a program with us in the same subject. They say it is more practical and they get more out of it that way, and I speak of the airmen, and not the commanders.

The CHAIRMAN. Thank you, sir.

Mr. SMELSER. Mr. Chairman, I am going to read my statement, not for the same purpose that Dr. Mobley did, but because I am too unimportant for anybody to object to my quoting them or misquoting them. I do not think that it would bother them if I did. In fact, I am just a small man. No one even objected to my going out of my way in getting here by air. But I do this to limit myself. We Cajuns have a bad habit of talking too much. Then I do not want to lapse

into Cajun dialect for this gentleman over here would not know what I was talking about.

I wish the gentleman from New York was still here, because I have a Cajun story that would answer his question about this local taxation.

We had two Frenchmen who met recently and one asked the other: "What are you going to do about those tax for those bonds to buy—build those what you call gymnas for the high school?"

He said, "My, I don't know."

"But I say I been study a lot about that and about 3 maybe 4 year ago" he said, "We pass a tax to buy school bus so we can pick up the kid and take them to school and they don't got to walk no more. Now, we got to spend some more money to build a gymnas so that they can take some exercise yet."

So there are all sorts of excuses for these taxations.

In the paper which has already been handed to you I have attempted to describe an area vocational technical school as briefly as possible.

The history of our school began in 1940. The total enrollment for that year was 199 day students. During the 1956–57 school year the enrollment had grown to more than 3,200. That is our yearly enrollment. For more than 4 years during World War II the school operated on a 24-hour basis at the request of the National Government. During that period of time more than 6,000 war workers were trained. Immediately after the war the school was practically forgotten by those in authority who controlled the finances. However, community effort brought this to the attention of the public and I have some evidence of the public interest that you might look at.

Better finances were made available and the school has enjoyed a gradual growth. About 2 years ago the appropriation leveled off, with a resulting leveling off of the service and the enrollment.

This area of vocational technical school offers an educational program ranging from business education and distribution to the highly technical occupations in the field of electronics. Classes are conducted for the training of skilled workers in a variety of mechanical crafts and 10 separate technical courses are offered. Practical nursing is the major course offered in the field of health education.

This type of school offers the greatest flexibility of any educational institution. Courses are instituted on a basis of need and discontinued when such need no longer exists. The course of study is based on the needs of workers in business and industry and is determined by consultation with an advisory committee. Students are taught on an individual basis and may progress according to their own ability. Courses are organized and conducted to meet the needs of new industries and expanding industries. New industries have been established in Louisiana because of this program of area vocational technical schools.

The students from this school are in such great demand by business and industry that they seldom graduate. In 11 years as director of that school, I have signed less than a dozen completion certificates for our business education department. Students are placed in employment when the school officials feel that they are employable.

The school is not able to accommodate all applicants and some have been on the waiting list since October of last year.

The success of this school came about because the people in the area it serves consider it a part of their overall educational program. It is accepted by the community as an educational institution where young people and adults may obtain the type of education they desire.

In brief, this school has prestige. Schools such as this one, properly financed and given the necessary prestige by such leaders as you, can train highly competent technicians who will be able to take their places beside the scientist and engineer in reaching the goal for which this Nation strives.

Since we must have at least five technicians for each scientist and engineer, it is imperative that the necessary impetus be given to a program of training that will meet this need.

The action of this committe could be a good starting point for such a program.

Thank you, sir.

Mr. ELLIOTT. Thank you very much, Mr. Smelser.

The prepared statement of Mr. Smelser will be entered in the record at this point.

(Statement referred to follows:)

STATEMENT OF REX H. SMELSER, DIRECTOR, SOWELA VOCATIONAL-TECHNICAL SCHOOL, LAKE CHARLES, LA., REPRESENTING THE LOUISIANA VOCATIONAL ASSOCIATION, THE NATIONAL COUNCIL OF LOCAL ADMINISTRATORS OF VOCATIONAL EDUCATION AND PRACTICAL ARTS, AND THE AMERICAN VOCATIONAL ASSOCIATION, INC.

Mr. Chairman, Gentlemen of the Committee, my name is Rex H. Smelser. I am director of Sowela Vocational-Technical School in Lake Charles, La. This school is operated by the State of Louisiana under the supervision of the State board of education. I am appearing before you as a representative of the Louisiana Vocational Association, the National Council of Local Administrators of Vocational Education and Practical Arts, and the American Vocational Association, Inc. All of these are professional organizations with a combined membership of more than 39,000 persons representing teachers, supervisors, administrators, officials, and others interested in the development and improvement of vocational and technical education in the United States and its territories.

Other witnesses will point out, if they haven't already done so, the history and background of vocational-technical education, as well as the importance of this phase of education to our American economy and our national well-being. I am sure that they will present you with many facts and statistics which will leave no doubt that vocational-technical education is not only important, but essential to the well-being of our country in peace time as well as in times of emergency.

Since my experience for more than 20 years has been in the field of administering a local program for the education of skilled workers and technicians, I shall limit my remarks to the description of a successful program of this type. This could be the area vocational-technical school in your district since such schools are already in operation in most of the States at the present time. If this report sounds boastful, please remember the speaker is attempting to describe the school in your area, and I am sure you are just as proud of your school as I am of mine.

Sowela Vocational-Technical School opened its doors to students and inaugurated its first classes on September 25, 1940. During the first year 199 day students pursued courses in machine shop, electricity, auto mechanics, drafting, and commerce. This figure increased over the years until the enrollment for the year 1956–57 showed that 933 day students pursued studies in some twenty-odd courses, and 2,356 adults attended evening classes in more than 30 different types of studies. You may be interested to know that we enrolled more than 100 students in January who were dropouts from college at midterm. This would seem to indicate that the bill under discussion should provide a program of guidance for college dropouts. It is a universally accepted fact that approximately 50 per-

cent of those entering college drop out the first year. Many of these would be excellent technicians if they had the proper guidance and training.

We now operate our main school in Lake Charles and seven single-unit branch schools in other communities of our area. We will open another branch school in Cameron Parish next September. The offerings in our day program now include a wide variety of studies ranging from business education and distribution to the highly technical occupations in the field of electronics. We conduct classes for the training of skilled workers in auto mechanics, machine shop, welding, carpentry, cabinetmaking, diesel-engines mechanics, stationary-engines mechanics, and radio repair and service. You will also find courses of a highly technical nature such as drafting, chemical technology, advanced blueprint reading, marine technology, industrial engines, petroleum technology, basic electronics, radio-TV broadcasting operation, petroleum exploration electronics, and industrial instrumentation. Our courses in distributive education, practical nursing, and business education are well received by the community.

We have always stressed what we refer to as technical mathematics and science. The only difference in our mathematics and science and that taught in other schools is possibly in the method of teaching. We teach these subjects by practical application so that the student realizes a need for the subject. We have a fairly-well-equipped laboratory in which we teach physics, mathematics, and chemistry as they apply to the other technical fields taught in our school.

The evening program is built entirely around the needs of the working adult population of our area. Courses are organized to meet the needs of industry and the people, and the content of such courses is determined by consultation with an advisory committee chosen from the field of work represented.

Our type of school is the most flexible educational institution in existence. We discontinue the teaching of any course when the need no longer exists for persons in that field of endeavor. We organize new courses when there arises a need for the training of persons in some particular line of work. We also organize new courses to assist in the training of workers for a new industry or an expanding industry. Several industries have located in Louisiana because of our area vocational-technical school program. We are at the present in the process of organizing an emergency training program in one of our communities where an industry recently closed. The workers in this industry will be retrained for employment in other lines of work.

The need for our program of education can best be justified by a look at our placement record. Industry and business in our community have accepted our program of training to such an extent that we are not able to keep our students long enough for them to graduate. We are constantly called upon for employees, and we place them when there is evidence that they are employable. We have more calls for employees than we have students available for the jobs. Another sign of the value of the training given in the area vocational-technical school is the constant waiting list that we keep. At the present time we have names on our waiting list whose applications were filed as far back as October 1957.

You may judge from the tone of this report that our area vocational-technical school is so busy with its educational program that it has no time for anything else. In a sense, this is true for we have no athletic program or extra curricular activities. However, the staff of the school and the student body are active in many community affairs. We build playgrounds, Little League baseball parks, flagpoles, parking racks for bicycles, and many other educational and recreational items. We participate in safety programs, community-fund drives, and other such activities. Our disaster work was recently cited by Civil Defense. We are now working with Civil Defense on a plan to evacuate, setup, and operate a control center 30 miles from the Lake Charles industrial area. We maintain all their equipment.

Gentlemen, I have attempted in this brief time to describe what can happen to the vocational-technical school when it is accepted as a part of the overall educational program. I believe success depends upon four main factors:

(1) The program must be flexible, with the offerings based on the need for such training.

(2) The material taught must meet the needs in that area of training.

(3) The school must have prestige in the community so that its program will be accepted as a part of the overall educational program.

(4) There must be adequate finance.

The success of this school, which has been presented here only as an example of hundreds of others, did not come easy and without effort.

Forty-three days after it was opened, a national emergency occurred, and we were called on to start training for national defense on a 24-hour basis. For more than 4 years we did not close our doors except on the Sabbath. We trained over 6,000 war workers. When that program ended, we were forgotten by those in authority who provide the money. We felt like the bride who was so very much wanted until the groom realized that she needed a new wardrobe. We started our peacetime program with a total annual appropriation of a little more than $45,000, but our school is located in a community noted for lifting itself when the necessity arises. Citizens' committees were formed, and many subcommittees were appointed. One of these was known as the public relations committee and was made up of representatives from all media of public communication. News reporters, radio commentators (TV commentators were later added), free-lance magazine writers, outdoor-advertising executives, and others all did their work well. Within a 12-month period of time, 13 national magazines carried feature articles about the school. Some phase of the school program was included in each broadcast of CBS World News Roundup every evening over a period of 1 month and later at regular intervals. We became the first vocational-technical school to be featured on the TV program, Industry on Parade. We have the distinct honor of being the only such school to have won the Freedoms Foundation George Washington Honor Medal "for outstanding achievement in bringing about a better understanding of the American way of life."

In closing, gentlemen, may I say vocational-technical education needs money to buy modern equipment so that we may keep up with the industry for which we are training, but we also need your acceptance of the importance of our program so that we may have the prestige we deserve with the American public. The people of this great Nation of ours have developed a national philosophy that any education other than a college education is not the proper thing for their child. It is only for the child of their neighbor. We need to develop a national feeling that work is honorable and that those who put into reality the dreams and diagrams of the scientists and engineers are just as necessary and just as important to our American way of life as those who had the dreams. Without the skilled workers and the technicians who have built and who maintain the great luxuries that we enjoy in this country, we would be living as the peoples of less-fortunate nations are now living. We would not be able to boast that we have more automobiles, more radios, more television sets, more refrigerators, more air-conditioning units, yes, even more bathtubs, than all the nations combined. We would not be able to produce the machines and weapons of war without these same people because there would be no one to put into reality the dreams and diagrams of the scientist and engineer. I would like to ask you, as men of influence, to do your part not only by making funds available but by starting a movement among the news media people to stress the importance of technical education along with that of the scientist and mathematician, because we must have them both.

I am taking the liberty of including as a part of this report a series of telegrams sent by this witness to the President and Members of Congress.

LAKE CHARLES, LA., *November 14, 1957.*

The PRESIDENT,
The White House,
Washington, D. C.:

Your suggestion of a stepped-up educational program to train more scientists is of the utmost importance. However, we should put a great deal of stress on the training of technicians who can relieve the scientist and engineer from basic details that unnecessarily consume a vast amount of time that could be spent on research. We need a program to encourage those students who have no inclination, desire, or interest toward professional training to enter into the study of technology in order that the many scientists and engineers who are now engaged in menial routine report writing and testing may be free to spend their time on problems of a higher denomination. A program for training technicians can be worked out in a much shorter time, and the training period is much shorter than the training of professional scientists and engineers. Strongly urge that you appoint a committee of educators from vocational and technical education to

work with industry and Government officials on a plan to train this second echelon for the all-important task of reaching and holding our rightful place among the nations of the world.

REX H. SMELSER,
Director, Sowela Vocational-Technical School.

Not for release before November 21 except by the White House.

LAKE CHARLES, LA., *December 12, 1957.*

The PRESIDENT,
The White House,
Washington, D. C.:

Urgency of plan contained in my telegram to you of November 14, 1957, accentuated by news release of G. Kerry Smith, executive secretary of the Association for Higher Education. The plan outlined by Mr. Smith does not meet the requirements for the education of the second echelon. We will never win with all chiefs and no Indians.

REX H. SMELSER,
Director, Sowela Vocational-Technical School.

LAKE CHARLES, LA., *December 31, 1957.*

The PRESIDENT,
The White House,
Washington, D. C.:

We will surely become a second-rate nation if we do not produce a corps of first-rate technicians. Any educational program that provides no aid to technical schools or scholarships to their students is almost criminal and definitely shortsighted. Education at the top only will produce research and planning while technical education will aid the producers.

REX H. SMELSER, *Director, Sowela Vocational-Technical School.*

LAKE CHARLES, LA., *January 20, 1958.*

Senator LISTER HILL,
Chairman, Senate Committee on Labor and Public Welfare,
Washington, D. C.:

Since all legislation pertaining to education will come before your committee, I most humbly suggest that you keep in mind the value of our technical education program to national security and the vital work that is being done and will continue to be done by the properly trained technicians of this country. Scientists and engineers are extremely important, but we must have technicians to make a reality of the dreams and plans of these people. I strongly urge that you give consideration to assistance to area technical schools so that they may supply the technicians which are so badly needed.

REX H. SMELSER, *Director, Sowela Vocational-Technical School.*

LAKE CHARLES, LA., *January 20, 1958.*

Congressman GRAHAM A. BARDEN,
Chairman, House Education and Labor Committee,
Washington, D. C.:

As a champion of vocational-technical education I am sure you will make every effort to include the education of technicians in any legislation proposed to Congress this year. The training of scientists and engineers is an important phase of American education, but it has always been stressed as being more important than the training of technicians. The time has come when America must have more highly trained technicians in order that the plans and discoveries of the scientists and engineers may be put into practice. No doctor would enter an operating room without a corps of nurses, and likewise, no engineer or scientist

can produce the goods and materials necessary to our national security without a greater corps of technicians. I hope you will make every effort to include assistance to area vocational-technical schools in any legislation that comes before Congress.

REX H. SMELSER, *Director, Sowela Vocational-Technical School.*

Mr. ELLIOTT. Our next witness is Mr. F. Parker Wilbur, director, Los Angeles Technical Junior College, Los Angeles, Calif.

Mr. Wilbur.

STATEMENT OF F. PARKER WILBUR, DIRECTOR, LOS ANGELES TECHNICAL JUNIOR COLLEGE, LOS ANGELES, CALIF.

Mr. WILBUR. Mr. Chairman, I request that the entire presentation that I have made, that is in the hands of each committeeman, be entered in the record.

Mr. ELLIOTT. It will be entered in the record, as will the statement of each of the others who appeared here today, immediately following their testimony.

Mr. WILBUR. Thank you very much, Mr. Chairman.

My name is F. Parker Wilbur and I am the director of the Los Angeles Trade-Technical Junior College. It is an educational institution and it is part of the Los Angeles City Junior College District.

I am speaking today on the authority of about 26 years of experience as a teacher, supervisor, and administrator in the public school vocational-technical education. Additionally, I have had 2 years' experience during World War II as a civilian educational specialist. As such, I helped train 25,000 technicians for the Air Force. I worked 2 years as a staff training officer in the Navy in relation to Navy training schools.

I am presently chairman of the statewide study on vocational education in the State of California.

I am a member of the California Junior College Association, technical education committee, and I am a present member of the State vocational education steering committee which is a consulting group to the State department of education.

The college I represent has presently over 11,000 students. It is interesting to note that over a period of some 30 years this one specialized college has contributed to the occupational competencies of over 375,000 individuals in our community.

I think the committee is well posted on national manpower development. In the interest of time I am going to skip any comments, although they are included in my presentation.

In southern California we have had and continue to face a shortage in the area of technicians and skilled workers.

What about the future need in our own local area for such skilled workers and technicians? We know that the labor force nationally is going to be larger, but locally—according to the Southern California Research Council, the most authoritative group we have—the manpower needs for the Los Angeles metropolitan area alone for craftsmen and foremen will exceed the nationwide total in the 1960's. Locally, it will increase at the rate of about 166 percent by this period. The need for operators and kindred workers will increase at the rate of about 139 percent by the 1960's. This has been a real problem, trying to meet the present expansion of growth in the area.

In 1956 some 120 companies in the metal trade industries alone were unable to secure trainees to go to work in their plants because we simply could not turn them out fast enough. That was in a period of a single year.

The area market for jobs is growing because the area is growing. This metropolitan area job market has grown persistently and rapidly. In our metropolitan area the population prior to World War II was 2,900,000. It has increased in 1950 to 4,300,000 and as of January of this year we had in our area 6,165,000 people. This net gain, as you can see, exceeds 3 million.

In Los Angeles County alone, which is only a part of the metropolitan area, it is estimated we will have a population of over 6 million by 1960. Therefore, we are pressed with a serious problem in relation to manpower development for this area.

Our junior college has been expanded as would be expected to help meet this serious problem of developing manpower. Our own college has increased enrollments rapidly in recent years. The school has extended services to other occupations and to technical areas.

Growth has been so rapid that we now have 142 full-time day instructors, and 350 evening instructors, a total of 492.

We have in the day program over 151 different offerings and at night 423 different offerings. All of these offerings are in the area of technical education.

Our school, then, is a specialized kind of junior college, organized to enable employed people to study at night to extend their occupational abilities and to prepare day students for occupational employment directly upon the completion of the courses.

The growth rate of our college last year was over 15 percent, which is interesting because this is double the rate of the growth of junior colleges in California.

Our lack of facilities is so pressing that we have programs scheduled on three shifts a day, running continuously from 7 a. m. until 9:30 in the evening.

The three shifts serve areas of drafting trades, machine shop, welding, technical illustrations, and others. We have met some of our local manpower training needs through special work in the direction of assisting local industry. We have organized a special program in supervisory training, requested by the Metal Trades Association of Southern California. We have an experimental automation technical training program for steelworkers. We are providing instruction in related trades for over 2,000 apprentices in our evening school. We started an evening branch school that is conducted in the high-school property 10 miles from our main campus. There we have programs in the areas of aircraft and missiles, with over 1,000 students enrolled. Of this thousand, something like 700 are studying various courses in electronics.

Now, in spite of these sanctions, we simply cannot serve all the people who apply. Today, over 2,500 applicants are on our waiting list. Some of these people will not be enrolled for months, due to lack of space.

We have continuously followed up our students and, through studies, we can show they are vocationally prepared for employment and they are accepted by industry.

To keep posted, and to keep the school and industry working hand in hand so that our standards and training are satisfactory, we have 37 organized advisory consulting groups from industry who meet with us regularly.

I hope the committee will take a look at the list on the program which is part of the materials I presented and note the high caliber of industry people who are on these committees.

Further, there is no one on any committee who has not been active this year. This is not just a list of names. This is a list of people who work actively on the committees. If not, their names would not be included on this list.

Because of these concerns and the comments I have included in my full presentation, I should like to recommend four points in regard to the pending legislation.

1. I believe, if enacted, this legislation would have an immediate and stimulating effect on the extent, and particularly the quality, of the services of American vocational-technical education. It could be that, within a few months, it would be possible to expand vocational shops and applied technical laboratories. We could purchase training aids and modern equipment to replace obsolete, well-worn equipment. We could buy additional facilities for vocational-technical programs.

2. I believe there is a long-term need for the further development of professional counseling and vocational guidance related to the conduct of vocational-technical education programs. Industry itself is putting in counseling and guidance programs within its own plants. It is necessary for us to relate to them on the same professional level.

3. There are clear and well-established areas of responsibility with respect to the conduct of professional and technical education in California and throughout the Nation. In the statement of the California restudy of higher education, this is plainly pointed out. Our universities and 4-year colleges are identified with and will continue to provide scientific research workers and professional-level engineers. But in the future, as it is true now, much of the vocational-technical type of worker will continue to be the educational responsibility of area technical schools and junior colleges such as the one I represent. We need additional Federal assistance through our State-reimbursement plans if we are to continue to provide the realistic and acceptable training programs that are essential to the further development of our manpower resources.

Lastly, I would like to recommend that provisions for national-defense scholarships (title II) and the national-defense student-loan program (title III) should be extended to include scholarships for selective, deserving students at the post-high-school level who are entering vocational-technical education in junior colleges or in area technical schools. The need to assist this high-level type of individual to obtain education to enter the professions and technical occupations is vital to the economy, I believe.

Thank you very much for the opportunity to come here and present these viewpoints.

Mr. ELLIOTT. Thank you very much, Mr. Wilber. Your prepared statement will be entered in the record at this point.

(The statement referred to follows:)

RECOMMENDATIONS PERTAINING TO SENATE BILL 3187 AND THE IDENTICAL MEASURE, HOUSE OF REPRESENTATIVES BILL 10381

My name is F. Parker Wilber, director of the Los Angeles Trade-Technical Junior College, an educational institution that is part of the Los Angeles City Junior College District; at this 1 college we now have presently enrolled 11,023 students, comprising 3,400 daytime students and over 7,600 evening-school part-time students. This college has, in a period of over 30 years, contributed to the vocational-technical training of over 375,000 students.

Upon this occasion, I am speaking from an experience and background of over 26 years as a teacher, supervisor, or administrator in public-school vocational-technical education. I have also had 2 years of experience as an educational specialist for civilian-personnel training for the Air Force, and 2 years as a staff training officer in the United States Navy related to Navy vocational schools.

EMERGENCY NEED FOR VOCATIONAL-TECHNICAL TRAINING

America is now enmeshed in a perilous series of world tensions. These ongoing circumstances, together with the spectacular achievement of Russian scientists, engineers, and technicians, demand the urgent development of more professional and technical manpower for our Nation's defense program. This is a pressing educational and industrial problem. The situation reemphasizes the Nation's responsibility for cultivation of individual talents and capabalities. Far beyond idealism, we now have the emergency need to employ this tenet as the most practical means of mustering the various types of manpower and ability required, if we are to meet the momentous circumstances of today and also provide for the Nation's normal development.

America's vocational-technical education is most concerned and deeply involved in our Nation's manpower development, for it is we who are occupationally training each year some 3,413,159 adults or youth in our public secondary schools, area technical schools, junior colleges, and across our entire Nation.

Along with other educators and the public commonly, we fully appreciate the importance of appropriateness and values of general education for all. But from our everyday experiences in industrial training programs, we are sensitive to the inadequacy of further general education, in and of itself, to provide an immediate solution to our shortage of skills or the long-term need for trained manpower. Technical manpower training for the needs of our country will be best met through the extension of existing technical programs now distributed widely throughout the United States, and which are already geared to realistic, occupational standards acceptable to industry. It is through such existing programs that much of America's vocational-technical competency is already being achieved.

It is important to note that employers generally, even under the existence of emergency needs, are reluctant to hire untrained or nonspecialized personnel. Here is a specific example from the Los Angeles city area: one aircraft company, throughout the year of 1946, was anxious to hire electronics technicians and conducted extensive recruiting. During this year the company had 2,700 electronics technician applicants, interviewed 549 after screening, and actually hired only 244 individuals—only those competent or within reach of competency in this highly specialized field. The same company, in the same year, had a similar experience in hiring machinists: 1,250 machinists applicants were obtained; 250 were interviewed after screening and the company hired only 96 people. I believe this actual local case example, and others that could be provided, indicate the necessity for technical applicants to have completed specialized training, apprenticeship, or a vocational-technical program.

SHORTAGE IN TECHNICIAN OCCUPATIONS

In viewing the Nation's technical occupation shortages, it is obvious they are in part in the areas of technicians. These shortages were obvious during World War II, the Korean conflict, and continuing to the present. Some of these technician occupations are relatively new to the economy, and the public is unaware of their demand. More generally, the public is aware of the shortage in the professions, such as in certain professions as engineering or teaching.

The more precise identification and development of the new technician occupations is of high consequence to the Nation and will require some new vocational-technical programs designed to specifically meet their work requirements in these occupations. Technicians are skilled workers who have had 2 or more years of specialized training beyond high school but who typically do not hold professional college degrees. Technician fields arise from the application of scientific processes and techniques to modern industrial research, development, and production. Technicians are needed for a variety of types and levels and their duties range from highly technical tasks to simple routines. Because of these variations and specific activities, it is difficult to formulate job descriptions and plan training programs. Examples of job titles in the technician level occupations are such as the following: Aircraft industry manufacture and/or transportation: time study analyst, tool designer, draftsman, cartographer, laboratory technician, engineering technician, electronics technician, technical illustrator, technical writer, flight engineer, instrument technician; other industries (additional titles): production supervisors, technical assistant to metallurgists, broadcast engineers, advertising production man, TV technician (production), TV final tester (production), technical salesman, powerplant and substation engineer, inspectors, architectural draftsman, construction estimator, and layout man.

A technician may be described as a person who works at a job which requires applied technical knowledge and applied technical skill. His work, in this respect, is somewhat akin to that of the engineer, but usually the scope is narrower. His job also requires some manipulative skills—those necessary to handle properly the tools and instruments needed to perform the technical tasks. In his special field, he has considerable technical knowledge of industrial processes, and in this field he knows how to apply the necessary principles of the physical sciences and of mathematics. In general, he uses instruments, in contrast with tools. His contribution is mainly through mental effort in contrast with muscular exertion.

Frequently a technician's work assignments are made by a professional, who generally supervises the decisions and interpretations; thus typically a number of technicians work for one engineer, or staff laboratory technicians are under the direction of the scientific specialist or a project supervisor. In this manner, many jobs once performed by professionals have been reorganized so that technicians can perform them efficiently under direction. Further delegation of duties, formerly assigned to professionals, is now encouraged in industry and can be expected to multiply in the future. The demand for technicians seems certain to accelerate and to continue.

Technicians are increasingly important because of the complexity of modern machines, technological changes, automation, and the increasing role of scientific knowledge and the conduct of industry. The present demands for technicians is at least comparable to that for engineers. Draftsmen, for example, 12,019 in 1910, rose to 88,000 in 1940 and to 145,000 in 1950. Technical employees on the staffs of industrial research laboratories increased from 16,400 to 40,800 during 1940–1950 decade—a rise of about 150 percent.

Providing suitable training programs for technicians has been a post-War II development at the Los Angeles Trade-Technical Junior College and other junior colleges throughout southern California. Across the Nation other appropriate technical programs for technicians are carried on in area technical schools, technical institutes in junior colleges, and through apprenticeship. The success in these post-high school, less than 4-year university programs, in meeting the training manpower needs for technicians should act as a guidepost for the future education and training of technicians in America.

ELECTRONICS TECHNICIANS

Electronics is a technician field critical to defense preparation which has experienced tremendous growth in the last 2 decades. Electronics technicians are involved in the operation of electronic equipment and must understand complex laws of physics. Professional engineers most often design and develop the initial equipment but the electronic technician installs, tests, maintains, and repairs electronic equipment. Even though technicians vary with the industries and services they work in, there is a common body of knowledge and skills related to most electronic technicians. These technicians particularly call for aptitude in math and physical sciences.

Establishments employing 90 percent of the electronics technicians are in the following groups: Home radio and TV repair, radio or TV broadcasts, manufacture radio and TV receivers, manufacture other electronic equipment, manufacture military aircraft, research and development.

National surveys established that technical school level courses are the most important type of training for electronics technicians. Further, over 50 percent of all electronics technicians have attended full-time civilian technical schools for a period of 1 to 2 years; about 1 out of every 4 have taken additional part-time technical training; another one-third have received training in Armed Forces schools 6 to 12 months in length, and only a small percentage of these technicians receive their training through on-the-job training programs (about 13 percent).

FUTURE NEED FOR CRAFTSMEN AND OPERATIVES

The projected structure of the labor force expected by 1965 indicates that the occupational category of "professional and technical" will increase by about one-third throughout the Nation; what is equally important is the statistical projection that the category "craftsmen and operatives" will expand at about the same rate, at least by one-quarter.

According to the Southern California Research Council, the manpower outlook for the Los Angeles area in the 1960's for "craftsmen and foremen" will increase about 166 percent and "operatives and kindred workers" will increase about 139 percent.

In contrast to the demand for skills that are certain to increase in the years ahead, Secretary of Labor Mitchell has been recently shocked by the lack of interest our young people have shown lately in craftsman occupations. Between 1951 and 1956 there was a drop of 28 percent in the number of skilled craftsmen under 25 years of age. This decline is attributed to the failure to direct young people into work with an eye to their own inclinations and abilities rather than to work offering higher wages or the possibility for the possession of material things. In spite of the additional skilled workers that will be needed which come as a normal expansion of the economy, it may be difficult to find workers with the necessary skills to man industries that are becoming more specialized and complex. This will require, among other things, a more extensive and more realistic counseling and guidance program in the secondary schools and junior colleges.

CHANGING ADULT POPULATION THAT AFFECTS MANPOWER

Recent United States Department of Labor statistics indicate that the age group 25–44 years (the typical working force ages) only grew about 10 percent during 1945–55; and this group, now 47 million, will actually decline some 600,000 by 1965. This group is practically a static-sized group at a period when we will need greatly expanded numbers of manpower in this age group. If the demand for goods and services in America continues at the rate prevailing in recent years, the economy will require some 74 millions in the labor force by 1965 (an increase of about 10 million workers). Most unfortunate for the Nation, it is very possible that the work group 25–44 years of age will be in short supply in the next 5 to 7 years.

It is important to note an improved quality of job performance is required of the labor force and is constantly being demanded by employers. With no evident increase in the 25–44 group in the next 10 years ahead, it is important to develop the abilities of this group to the highest potential to enable this limited sized group to perform with productiveness, skill, and versatility.

It appears that about one-half of the increase in the future labor force will be in the younger 14–24 year age group. This group, now 5 to 15 years of age, and attending our elementary grades or junior high schools, need realistic guidance, a good general education, and vocational-technical training in the immediate years ahead if they are to enter the labor force and become qualified, competent workers. Many of this group who are qualified should be encouraged to enter vocational-technical education programs as they reach the suitable educational level, so as to prepare to enter the professional and technical fields in which they will be so badly needed in the future.

LOS ANGELES JOB MARKET

The characteristic of the Los Angeles metropolitan area job market has been its persistent and rapid growth. The statistics are striking. Prior to outbreak of World War II the population of Los Angeles metropolitan area was 2,916,403,

and had by 1950 dramatically increased to 4,367,911, and in January 1958 was 6,165,000. The net gain in this period has been over 3 million individuals.

During the 1952–53 period, this area was growing at the rate of about 200,000 individuals per year and is now only slightly less than this rate. In recent years the annual net gain in population in the Los Angeles area has been equal to that of the entire cities larger than Tulsa, or Salt Lake City, or Grand Rapids, or Nashville. It is estimated that the Los Angeles County area alone will be over 6 million people by 1960, according to the annual review of the Los Angeles Chamber of Commerce.

Los Angeles city and county employment is characteristic by its diversification of job opportunities. The Los Angeles County employment ranks third or higher in total dollar volume in 26 different industries.

When analyzed by major-industry groups, employment is dominated by wholesale and retail trade, and by manufacturing. Employment in manufacturing indicates substantial dependence of the community upon production of aircraft and parts, approximately 25 percent of the total employment is in aircraft manufacturing enterprises in the Los Angeles metropolitan area. The local aircraft manufacturing and its related parts manufacturing represents about 22 percent of the total national employment in aircraft industries and is the largest concentration of aircraft facilities in the United States.

Striving to meet some of the professional and technical education needs of this sizable job market has been a paramount task of the vocational-technical programs in the local high schools, and particularly in technical divisions of junior colleges. As an example, the continuous expansion of the Los Angeles Trade-Technical Junior College, and other junior colleges in the Los Angeles School District, it is a reflection of the efforts to train for professional and technical manpower needs of our area.

In the instance of the Los Angeles Trade-Technical Junior College, the enrollment has climbed steadily in recent years until it is over 11,000 students and has extended its scope of service in the skilled trades and technical areas. This specialized college has a present full-time faculty of 142 and an evening part-time faculty of 350, a total of 492. The courses involve 151 day vocational-technical programs and the evening school has 423 courses of instruction. The educational contribution of this college enables daytime students to go directly into employment in the local industries and the evening-school program is designed to enable employed personnel, or those normally employed, to upgrade their abilities in their field of employment or a related one.

The principal departments in the Los Angeles Trade-Technical Junior College are as follows: Aircraft, apparel, art, drafting, automotive, metal, building trades, building operation and maintenance, culinary arts, electrical, electronics, printing and lithography, and nursing. The associate in arts degree is available for students who meet both the technical education and academic requirements. Enrollments have grown in the last school year at the rate of about 15 percent above the year 1956–57; this is about double the growth rate of most junior colleges in the State of California. It is through specialized vocational-technical programs offered at this college and through similar technical division offerings in other junior colleges throughout southern California that much of the future manpower needs of this area will be met.

Due to lack of facilities at Los Angeles Trade-Technical Junior College, a number of programs are scheduled on a 3-shift-per-day basis; continuous use of the space from 7 in the morning to 9:30 in the evening. This is already in practice in the following offerings: Drafting, machine shop, welding, and technical illustration, and soon for electronics. Other ways the college has met industrial needs is through the establishment of (1) a special supervisory training program requested by the Metal Trades Manufacturing Association of Southern California (175 line supervisors currently enrolled from these plants); (2) conducting an experimental automation technical training program for steelworkers in cooperation with the United Steelworkers of America local union; (3) providing instruction in related phases of apprenticeship training for over 2,000 students in the evening program; (4) establishment of a large branch school and training activity (10 miles from the main campus) primarily to meet the needs of aircraft industry employees (over 1,000 evening students enrolled), and (5) have established a year-round vocational counseling and guidance center including an aptitude testing program as part of the day-school curriculum. In spite of the foregoing expansion in recent years we are unable to service all those who apply—some 2,500 applicants are currently on waiting lists

to enter our day or evening vocational-technical programs, these applicants may have to wait for many months until space is available for them, due to the lack of available budget to buy expensive equipment or to further enlarge or rehabilitate our technical laboratories and shops.

Such institutions need additional Federal assistance for the further development of industrial shops, applied laboratories, and the typical professional laboratories required for preengineering.

Several followup studies, accomplished through contacting former students through questionnaires, strongly indicate that the vocational-technical students who graduate from the Los Angeles Trade-Technical Junior College are vocationally prepared to accept employment, that 85 percent of these graduates are employed in the occupations for which they were trained or in related occupations, that 87 percent of them believe that their vocational school training was helpful in getting their first job and that 96.2 percent of the graduates when asked this specific question on the questionnaire, "Do you feel that you could recommend the vocational training in this school to your friends?" answered "Yes." Several spot-check surveys conducted by the college indicate that the above findings are not only significant but generally consistent findings in each survey.

In order to be certain that the curriculum offered is consistent with occupational standards and trends, the college has organized 37 separate advisory committees who confer with the college regularly. These committees comprise over a total of 350 representative members from industry and the community.

RECOMMENDATIONS

I strongly urge the Congress to vote into law S. 3187 and H. R. 10381 including specifically Title XII: Vocational Education in Occupations Essential to National Defense. There are several paramount reasons for this recommendation:

1. This enactment would have an immediate and stimulating effect on the extent and quality of services of American vocational-technical education. Within a few months, it would be possible to expand vocational shops, applied technical laboratories, other laboratory facilities, and to purchase types of modern equipment, to replace obsolete equipment, so badly needed in the existing facilities of secondary schools, area technical schools, and in junior colleges.

2. There is a very long-term need for the further development of professional counseling and vocational guidance related to the conduct of vocational-technical education programs. Additional funds are needed to provide research, extension of facilities, training of personnel and other necessary arrangements for filling in this weak area in American education. There is becoming a closer relationship between counseling, guidance, and training for technical education in the years ahead, particularly if we are to employ and train all levels of individuals that will be needed in the future.

3. There are certain well-established areas of responsibility already existing in respect to conduct of professional and technical education. The lines of demarkation are not always black and white sharp but they are very real and they are present. Our universities and 4-year colleges are identified with, and will continue, to provide the scientific research workers and the professional level engineers. In the future, as it is true now, vocational-technical education designed to train craftsmen and technicians will continue to be the responsibility of area technical schools, junior colleges, and certain secondary schools; but they must tool up for the added responsibility of training increased numbers of specialized technicians and of a greater variety that are so urgently needed in the long-term planning of the American economy. The additional Federal assistance and partial support, through reimbursement plans, similar to those already existing, is needed by technical schools, secondary schools, and junior colleges if they are to provide realistic and acceptable training standards demanded by employers and industries generally.

4. The provisions made for national defense scholarships entitled II, and the arrangements for national defense student loan program entitled III, should be extended to provide scholarships for students in post-high-school levels of professional and technical education in junior colleges and 2-year technical institutes. The need to assist high-level individuals who will utlimately enter the semiprofessions, technician occupations, and skilled trades, and who will be needed in greater numbers than professional engineers in the future, should

be encouraged through these scholarships to enter occupations related to their choice and ability.

America's entire ability to compete with Russia and to provide for the normal expansion of the future may very well depend upon the training of technicians and skilled workers who now comprise the midmanagement, semiprofessional members of the labor force, and who as a group are an important element of the American research, development, production team. This vital occupational group lies between the engineers and the unskilled and it is they that create the reality from the dream of the scientists. These are the skilled people who build, install, maintain, service, and repair the equipment of today and the automation machines of tomorrow. Not the least of their responsibility will be that of reinterpreting the knowledge of the scientist into the reality and practical techniques needed for the world ahead.

Southern California Survey of Technician Positions Made in the Fall of 1957

SCOPE OF SURVEY

The survey included the study of 23 representative technician positions (actual company personnel department job descriptions) submitted by 8 Southern California companies involved in aircraft, missile production, and other defense activities. The study includes an analysis of job duties and performance of technicians. There were a total of 1,066 technician employees in this study.

Among the companies who cooperated in this survey are: Lockheed Aircraft Corp., Hughes Aircraft Co., Burndy Corp., and Waste King Corp.

METHODOLOGY

The management of the above eight companies approved cooperation necessary for the survey. The questionnaire was developed by the regional office, bureau of industrial education, State of California. This questionnaire comprised duty items that have been used in earlier technician studies conducted in various parts of the United States.

The questionnaire was filled out by the immediate departmental supervisor to whom the technicians were assigned. The supervisor's viewpoint was desired in order to obtain a functional viewpoint rather than a theoretical or front office opinion.

The survey tabulation was summarized under five headings following each item or duty statement, that is, "regular," "frequent," "occasion," "seldom," "never." The types of job duties inquired about in the survey were classified under the following headings:

1. Working with equipment.
2. Working with instruments and gages.
3. Working with production.
4. Working with materials.
5. Working with machine, hand tools, instruments.
6. Working with drawings, reports, records, handbooks.
7. Working with energy and power.
8. Working with other personnel.
9. Other activities not listed above.
10. Mathematics.
11. Science.
12. Communications.
13. Relations with people and organizations.

TECHNICIANS SURVEY

The types of technician jobs surveyed in the study (actual job descriptions) included: Laboratory technician, electronics technician, senior electronics technician, industrial instrument technician, research technician, flight test radio technician, radio and radar technician, plate man, time-study man, electronics engineering associate, and engineering assistant.

SUMMARY

From the frequency of answer to the duty items included in the survey, it appears that technicians employed in the 23 categories within the 8 companies surveyed have the following characteristic duties:

1. Working with equipment:
   (*a*) Performs experiments.
   (*b*) Operates equipment.
   (*c*) Tests and tries out equipment.
   (*d*) Adjusts equipment.
   (*e*) Trouble shoots equipment.
2. Working with instruments and gages:
   (*a*) Performs experiments with instruments.
   (*b*) Inspects with instruments.
   (*c*) Trouble shoots with instruments.
   (*d*) Sets up measuring instruments.
   (*e*) Makes computations from instruments.
3. Working with drawings, reports, records, and handbooks:
   (*a*) Plots, curves, graphs.
   (*b*) Reads technical reports.
   (*c*) Uses engineering and technical manuals or handbooks.
   (*d*) Makes freehand sketches, working drawings.
   (*e*) Records and compiles data.
   (*f*) Works with blueprints, sketches.
   (*g*) Works with wiring diagrams.
4. Working with other personnel:
   (*a*) Works with individual persons.
   (*b*) Works with group situations.
   (*c*) Advises other personnel on technical problems.
   (*d*) Works with other departments.
   (*e*) Consults and seeks information from supervisors.
5. Communications:
   (*a*) Putting across ideas, explanations.
   (*b*) Describing conditions, causes.
   (*c*) Verbalizing and discussing problems.
   (*d*) Communication with all concerned.
   (*e*) Making records and reports.
   (*f*) Writing short notes, brief directions.
   (*g*) Reading written communications.
6. Relations with other people:
   (*a*) Ability to achieve with a minimum of supervision.
   (*b*) Trying out and testing new ideas.
   (*c*) Carrying out assignments.
   (*d*) Working closely with project engineer.
   (*e*) Giving help when requested.
   (*f*) Understanding of organization and teamwork.
   (*g*) Following up on assignments and work done.
   (*h*) Understanding his responsibility.
   (*i*) Contacting foreman.
   (*j*) Keeping abreast of new developments.

Technician's duties that were indicated in the columns marked as "occasion," "seldom," or "never" were as follows:

1. Working with production.
2. Working with materials.
3. Working with energy or power.
4. Mathematics excepting the following: "substituting in formula," "interpret drawings," "using handbooks and manuals"; also, excepting in the "occasion" column, 25 percent or more indicated these duties: "solving equations," "interpreting reports," "layout work," "interpreting drawings," "computing angles," "computing shapes," "calculating indirect measurements," "accounting time and materials," "interpreting reports."
5. Science, excepting 25 percent or more who answered the column "occasion," indicated these duties: "using springs," "rotating masses," "relating mechanics to electricity," "transmitting sound and light," "distinguishing properties of metal."

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CONCLUSION

In general, this spot check survey indicates that the principal payroll duties of a technician are in the area working with equipment,-instruments, gages; working with drawings, reports, records and handbooks; working with other personnel; communications; and relations with other people. Those duties involving mathematics and science, while occasionally performed by some, most generally were noted as "seldom" or "never" on the questionnaires.

On the basis of the typical duties noted on the questionnaire, it appears that emphasis in technician training should be on use of equipment, instruments, and gages including techniques of technical drawings, making reports and records, use of handbooks, methods of industrial communications, and human relations. The survey indicates that the mathematics and science needed by technicians is of a very practical and applied type.

METROPOLITAN LOS ANGELES COMPANIES WHO HAVE EMPLOYED TRADE-TECH GRADUATES IN SKILLED TRADES (1955–57)

(A selected list)

Stewart Airlines
United Airlines
Presbyterian Foreign Mission
Douglas Aircraft
Hughes Aircraft
Pan American Airways
Lockheed Aircraft
Airesearch Corp.
Trans World Airlines
Cortsey Hudson Co.
Marvel Piston Ring
Hall Motor Co.
Four Cylinder Service
Anderson Auto Electric
Superior Pump Co.
Lucas Transmission Co.
Beverly Auto Service
Hall Motor Co.
Allred Bros.
Master Auto Repair
Downtown Alignment
Ace Brake Supply Co.
Double S. Service
Sparks & Barney Auto Service
Baida Bros.
Davidson Garage
R. L. Michael, foreign cars
Ideal Auto Shop
Shannons Motor Dome
Ulrich Nelson Mercury
Chevrolet Motor Corp.
Mobile Station
Leimert Auto Service
Piston Ring Co.
Wm. Bishop Bottling Co.
Engine Rebuilders
Al Stieskal Auto Repair
All American Service
Continental Trailways
Carburetor Sales
Wilson Service Station
Sabre Tool Co.
Schmidt Metal Bivans Corp.
Harville Die Cast
Gilfillan Bros.
Russell Burdsall Nut & Bolt
Convair
Marquardt Aircraft
Bethlehem Steel Co.
Union Die Casting Co.
Cannon Electric
Arwood Precision Casting
Anger Precision Products
Euclid Steel Co.
Lockheed Aircraft.
Commercial Casting Co.
Butler Publications
Hyson Engineering
Lees Photo Center
Associated Engineering
Dave Young Co.
General Air Conditioning
Steam Master Co.
Utility Trailer Co.
Earth Equipment Co.
Night & Day Hecters
Castle Steel
U. S. Metalic Tub.
L. A. Paper Box
North American
Consolidated Western Steel
Swinkspout Measure Co.
C. F. Braun Co.
Southwest Welding
Southwest Drafting Co.
Price Metal Co.
Summerbell Roof
Consolidated Hill
Prudential Insurance
Wm. O. Brock, building contractor
Ralph M. Parsons Co.
Byron Jackson Co.
Fulwider, Mattingly & Huntley Patent Office
Inyokern-China Lake
Callahan Eng. Co.
Jeffries Photo Engraving
Gillette Co.
Gashow Business Machines
L. A. Automotive Corp.
North American Aviation
National Rocket
Kaiser Steel Co.

METROPOLITAN LOS ANGELES COMPANIES WHO HAVE EMPLOYED TRADE-TECH GRADUATES IN SKILLED TRADES (1955–57)—Continued

(A selected list)—Continued

U. S. C. Research—Los Angeles County Hospital
United States Steel Corp.
Ruby Lighting Corp.
Gilfillan Bros., Inc.
Valvesiro Co.
Todd Shipyard
Department of Water & Power
Fluor Corp.
Consolidated Western Steel
Lily Tulip Cup Co.
Vitachrome, Inc.
Lloyds Advertising
Ben Bronson Advertising
C. & H. Supply Co.
Pacific Art & Title
Hank Sumid Studio
Meyercord Co.
Progressive Marking Co.
Philip Weideman & Associates
Librascope Co.
Brown Studio
Ad-Stat Co.
L. A. Parks & Recreation
Factory Fotos
Ramo-Woodridge Co.
Sam Elster Refrigeration
Southern California Refrigeration
Visual Drama, Inc.
KHJ T. V. Studio
Azdair Refrigeration
Fever Air Conditioning
Cozad Refrigeration
A–1 Refrigeration
Babe Stapp Co.
Owens Sheet Metal
Charles Lepicier
Vermont Press
K. & E. Blueprint
Graphic Arts Press
Dependable Folding
Hillside Press
Pacific Press
Trade Press
Van Row Folding
Stationers Corp.
Type, Inc.
Guild Printing Co.
International Industries
Tabular Typesetting
Fashion Press
Cunningham Press
Compton Printing
Asbarey Publishing Co.
Buena Park News
H. C. Liner Co.
Cole-Holmquist
Spokesman-Review
Master Printing Co.
Times-Mirror
Chambers Printing
Stewart Co.
Economy Litho
County General Hospital
Economy Blueprint
Aldine Printing
Repro-Art Co.
Emsco Manufacturing Co.
Southern Press
Davidson Corp.
Aero Press
General Printing Corp.
George Rice & Sons
Kruckelberg Press
L. A. Examiner
Aero Press
Moore Business Forms
Container Corp.
Hands & Ford
Lloyd Rudy
L. A. Paper Box Co.
Lockheed Aircraft
Zenith Plastic Co.
Western Air Lines
American Airlines
Viking Tool & Die
Cal Metals Co.
George H. Sasnik
Cedars of Lebanon Hospital
Hap Byers Photo
Cooper Publications
Hughes Tool Co.
Butler Publications
Gilfillan Electronics
Western Gear
Trend Engineering
Convair, Pomona plant
Rand Corporation
Litton Industries
Stelson Equipment Co.
Tru-Bor Manufacturing
Byron Jackson
McIntosh Precision Products
Jet Precision Products
Stauffer Chemical
Airesearch Corp.
Laub Machine Shop
Kembro Co.
Burroughs Corp.
L. A. Stamp Co.
Lead Insulator Co.
Consolidated Steel Corp.
Calco Corp.
Kaiser Steel
Rite Engineering
Culver Metal Products
Food Machine & Chemical Corp.
Air Logistics
Sharp Engineering
Breun Corp.
Todd Shipyards
California Packing Corp.
Ed Rice
Pereia & Luckman, architects

METROPOLITAN LOS ANGELES COMPANIES WHO HAVE EMPLOYED TRADE-TECH GRADUATES IN SKILLED TRADES (1955–57)—Continued

(A selected list)—Continued

Prudential Insurance
Southwest Drafting
Brener Marble & Tile Co.
Johnson & Engen
Austin Co.
C. Hughes Construction
Jacobsen, Coppedge, Huxley & Associates
Lloyd & Cooper
Knudsen Creamery
Aerojet General
Strickley Co.
Brodrick Scap Co.
F. C. Kingston Co.
Aluminum Corporation of America
Electronics Specialists
Business Systems
Buzza Cardoza
Capitol Records
Catalog Advertising Co.
Inner-State Auto
Western Lithograph Co.
A. Advertising Art Co.
Kaynar Products
Eastern Columbia
Art for Advertising
Sears Roebuck & Co.
Foster & Kleiser
Phil Charis Studio
Navy-Civilian Photo
United Press
Goodrich Rubber
Commercial Refrigeration Co.
Pacific Telephone & Telegraph
Walt Disney Studio
Los Angeles Refrigeration Co.
General Air Conditioning Co.
California Cornice Co.
Triple & Metal Co.
Western Air Conditioning
Cinema Center Printing & Publishing Co.
Walraven Printing Co.
J. B. Reeves & Sons
City of Los Angeles

OFFICE OF THE MAYOR,
Los Angeles, Calif.

To the Citizens of Los Angeles, Greetings:

Whereas the Los Angeles Trade-Technical Junior College fills an important community need by preparing students for 60 different occupations; and

Whereas through the cooperation of the Los Angeles Board of Education, labor, management, and the State and Federal Governments, provision is made for needed trade education at the Trade-Technical Junior College, which has developed skilled craftsmen who are proud of their calling and aware of their responsibilities as citizens; and

Whereas a homecoming, open house, and other special events have been planned for 1 week in recognition of the Los Angeles Trade-Technical Junior College's nearly 35 years of community service, during which it has trained some 375,000 industrial workers: Now, therefore, as mayor of the city of Los Angeles, I do hereby proclaim the period of March 3–8, 1958, as Trade Education Week in this city and I suggest that all citizens join in honoring this institution which has such an outstanding program of technical and trade training.

NORRIS POULSON, *Mayor.*

Mr. ELLIOTT. Now our next witness is Mr. George Kohrman, dean of the applied arts and sciences, at Western Michigan University, Kalamazoo Mich.

STATEMENT OF GEORGE E. KOHRMAN, DEAN, SCHOOL OF APPLIED ARTS AND SCIENCES, WESTERN MICHIGAN UNIVERSITY, KALAMAZOO, MICH.

Mr. KOHRMAN. Mr. Chairman, I am George Kohrman, dean of the School of Applied Arts and Sciences, Western Michigan University, at Kalamazoo.

Western is a university enrolling some 7,000 students, and organized into 5 schools, and I have the general responsibility for the supervision of 1 of these schools.

I came to Western from the State of Missouri in 1951. For 9 years in Missouri I served as State supervisor of trade and industrial education. During the period from 1943 to 1945 in Missouri I served as State director of war production training during which time I assisted in the preparation and training of several thousand—over 100,000—young men and women for the war industry.

Previous to that time I had several years of experience as a teacher in the secondary schools of that State.

I have received my bachelor of science, master's degree, and doctor's degree at the University of Missouri.

I have majors in physics, mathematics, and in industrial education.

Now in the few minutes allotted to me today I want to talk to you about three things primarily.

First, the program of vocational-technical training we have in operation at Western Michigan University; second, the need for such training; and, third, some of the major problems we face in conducting educational programs of this nature.

Starting in 1937 with a 2-year technical program in aircraft mechanics at Western, we have since added 7 other programs. Our offerings now include 2-year programs in the following areas: aeronautical technology, automotive technology, drafting and design, industrial electronics, machine tool technology, refrigeration and air conditioning, television, radio, and communications. Students who complete these programs are awarded certificates. The instructional staff has been obtained from the ranks of industry, men with experience in production and technology, who have shown special interests and aptitudes in teaching.

A testing program has been set up to screen the applicants on the basis of special (1) aptitude, (2) interests, and (3) general ability to profit from the instruction. In mathematics all students take algebra, trigonometry, and analytic geometry. Basic physical science and courses in oral and written English are part of the course of study.

And may I say that in our particular area of our university more students were turned down last fall than in any other area, primarily because of the high qualifications which we require and also the limitations we have for facilities.

What are the graduates of these 2-year terminal programs prepared to do? Who is this person we call a technician? The technician is a person who has a broad technical background so that he knows why things work, not just how they work. He is mathematically competent, understands laws and principles of the physical world about him, and is able to communicate effectively with others. The technician performs semiprofessional functions under the general supervision of the scientist, engineer, or plant superintendent. In many instances, the technician may serve as a liaison between the engineer or scientist on the one hand, and the skilled craftsman on the other hand.

We have operated these programs for several years under the provisions of the Federal Vocational Education Act of 1946, commonly known as the George-Barden Act, and the policies as outlined by the Michigan State Board for Vocational Education. It is doubtful if

we could have initiated these programs if it were not for the financial support received from the State and Federal Vocational Education Acts. Certainly our progress would have been slowed up a great deal without this financial assistance.

The need for technically competent manpower is urgent. Various studies have indicated that we could use from 3 to 15 technicians for each engineer. In a study made by the United States Office of Education during World War II, it was found that, on the average, 5.2 technicians were needed for each engineer.

This study is reported in the bulletin, Vocational-Technical Training for Industrial Occupations, Vocational Division, Bulletin No. 228, published in 1944, page 277.

Recent studies support these data.

Instead of having 5 technicians for every engineer, we actually have 1 technician to every 3 engineers. This statement is not to be construed in any way to imply that we do not need to increase our scientific and engineering manpower. We need more engineers and more scientists. Yet, these people cannot do the job alone. High speed production, automation, and other technological developments make it imperative that we also properly prepare other members of the manpower team. The technician is a very important member of this team.

Mr. Chairman, I would like to quote at this time from the Occupational Outlook Handbook, 1957 edition, published by the United States Department of Labor, in regard to the need for technicians.

Quoting on page 51:

> Along with the expansion in scientific and engineering there has been rapid growth also in technical occupations. In a single decade, from 1940 to 1950, for example, employment of industrial technicians increased by 150 percent. As scientific and technical work has become more highly organized, particularly in the laboratories and engineering departments of large firms, and in government agencies, more technical assistance has been provided for the professional workers. During World War II when severe shortages of engineers and scientists developed, it was discovered that part of the work formerly done by these professional workers could be handled by men with less training, thus freeing the professional personnel for more difficult tasks.
>
> In the postwar period with continuing shortages in engineers and scientists industries have hired more technical assistance and probably would have taken on a still greater number had it not been for the shortages of personnel which existed also in these technical occupations.

Up-to-date shop and laboratory facilities are a must in these programs. Most educational institutions are limited in the amount of funds available to properly build and equip a modern industrial education laboratory.

This is true in colleges and universities as well as in the secondary and vocational schools.

For example, the funds involved in equipping and maintaining a modern electronics laboratory are tremendous. Second, the matter of securing and keeping a well-qualified staff is no small task. Schools are in direct competition with industry for the best leaders and most competent men in the field. Third, a well-organized testing and counseling program is needed to assist in the selection of talented young men for vocational technical training.

This area is too essential to our national security to leave our manpower supply to chance, or to dropouts from 4-year-degree programs.

And finally, because of the specialized nature of the technical education it should only be offered where adequate staff, modern facilities, and necessary operating budgets are available. Only a limited number of institutions of this nature will be needed in each State or geographical area. These programs may well be offered in a 4-year institution, such as ours, a community college, a technical institute, or an area vocational school.

For your information, Mr. Chairman, and other members of the committee, I have included a list of the higher learning in Michigan, information furnished me by the State department of education in our State. You will find these institutions listed on page 4 of the materials which you have in your hands.

I would like to call your attention to the fact that practically every public institution of higher learning in Michigan cooperates with the State board for vocational education, and in each of these institutions we have one or more programs of vocational education.

The third institution in this list, Ferris Institute, is one of the oldest institutions in the country preparing young men in the mechanical trades. That is an area school on the State level.

The last institution in the list is our own, Western Michigan University, and you will note that we have an extensive program in this vocational field. We also have another program which is not listed and which does not share vocational funds. It is known as the Michigan Veterans' Vocational School. It is a rehabilitation center in which there are 200 students enrolled. It is a boarding school. Again it is a State area school.

In addition to the schools listed here we have 15 community colleges in Michigan which serve as area schools, and in which you will find sizable technical vocational programs.

On the next page in the materials which I have furnished you is a list of these institutions together with the types, outlining the types of programs which are offered in those institutions.

Finally, in these materials that are furnished for your information I have included four leaflets outlining various programs in our institution in this technical area.

I would like to call your attention to the one concerned with drafting and design. You will note on the second page of this leaflet a program of studies which these students take. I would like particularly to call your attention to the concentration that we have here in drafting. Even though this is only a 2-year program, the boys who take this program come out as highly trained technical workers in the drafting and design field. In fact, these students get a greater degree of specialties than an engineer would in this area.

In conclusion, I would like to say that we hope that title 12 of this bill concerning the area of vocational schools is considered favorably by your group. Especially do we hope that you consider the element of equipment. That seems to be one of the chief bottlenecks in developing technical education in most of our schools. Vocational train-

ing is needed badly if we are to keep up our place in the economy of the world. Area schools appear to be a sound answer to the problem.

Thank you, Mr. Chairman.

Mr. ELLIOTT. Thank you very much, Dr. Kohrman.

Your statement will be entered in the record at this point.

(The statement referred to follows:)

VOCATIONAL TECHNICAL TRAINING

By Dr. George E. Kohrman, Dean, School of Applied Arts and Sciences, Western Michigan University, Kalamazoo, Mich.

Today, in the few minutes allotted to me, I want to talk to you about (1) the program of vocational technical training we have in operation at Western Michigan University, (2) the need for such training, and (3) some of the major problems we face in conducting educational programs of this nature.

Starting in 1937 with a 2-year technical program in aircraft mechanics at Western, we have since added 7 other programs. Our offerings now include 2-year programs in the following areas: Aeronautical technology, automotive technology, drafting and design, industrial electronics, machine tool technology, refrigeration and air-conditioning, television, radio, and communications. Students who complete these programs are awarded certificates. The instructional staff has been obtained from the ranks of industry, men with experience in production and technology, who have shown special interests and aptitudes in teaching.

A testing program has been set up to screen the applicants on the basis of special (1) aptitudes, (2) interests, and (3) general ability to profit from the instruction. In mathematics all students take algebra, trigonometry, and analytic geometry. Basic physical science and course in oral and written English are part of the course of study.

What are the graduates of these 2-year terminal programs prepared to do? Who is this person we call a technician? The technician is a person who has a broad technical background so that he knows why things work, not just how they work. He is mathematically competent, understands laws and principles of the physical world about him, and is able to communicate effectively with others. The technician performs semiprofessional functions under the general supervision of the scientists, engineer, or plant superintendent. In many instances, the techician may serve as a liaison between the engineer or scientist on the one hand, and the skilled craftsman on the other hand.

We have operated these programs for several years under the provisions of the Federal Vocational Education Act of 1946 and the policies as outlined by the Michigan State Board for Vocational Education. It is doubtful if we could have initiated these programs if it were not for the financial support received from the State and Federal Vocational Education Acts. Certainly our progress would have been slowed up a great deal without this financial assistance.

The need for technically competent manpower is urgent. Various studies have indicated that we could use from 3 to 15 technicians for each engineer. In a study made by the United States Office of Education during World War II, it was found that, on the average, 5.2 technicians were needed for each engineer. Recent studies support these data.

Instead of having 5 technicians to every engineer, we actually have 1 technician to every 3 engineers. This statement is not to be construed in any way to imply that we do not need to increase our scientific and engineering manpower. We need more engineers and more scientists. Yet, these people cannot do the job alone. High-speed production, automation, and other technological developments make it imperative that we also properly prepare other members of the manpower team. The technician is a very important member of this team.

Up-to-date shop and laboratory facilities are a must in these programs. Most educational institutions are limited in the amount of funds available to properly build and equip a modern industrial education laboratory. For example, the funds involved in equipping and maintaining a modern electronics laboratory

are tremendous. Secondly, the matter of securing and keeping a well qualified staff is no small task. Schools are in direct competition with industry for the best leaders and most competent men in the field. Thirdly, a well-organized testing and counseling program is needed to assist in the selection of talented young men for vocational technical training. This area is too essential to our national security to leave our manpower supply to chance, or to dropouts from 4-year degree programs. And finally, because of the specialized nature of the technical education it should only be offered where adequate staff, modern facilities, and necessary operating budgets are available. Only a limited number of institutions of this nature will be needed in each State or geographical area. These programs may well be offered in a 4-year institution such as ours, a community college, a technical institute, or an area vocational school.

This, I believe, is one of the fundamental issues you are considering today. It has been a pleasure for me to present these ideas for your consideration.

Reimbursements for vocational programs in Michigan institutions, 1956–57

Central Michigan College		$7,309.00
Trade and industry	$3,400.00	
Distributive	3,909.00	
Eastern Michigan College		1,250.53
Homemaking	$1,250.53	
Ferris Institute		70.50
Distributive	$70.50	
Michigan School for Blind		2,726.90
Homemaking	$2,726.90	
Michigan School for Deaf		3,229.74
Homemaking	$3,229.74	
Michigan State University		38,669.98
Agriculture	$9,914.66	
Trade and industry	15,634.55	
Cooperative	7,693.10	
Distributive	5,427.67	
Northern Michigan College		7,901.10
Homemaking	$1,980.00	
Trade and industry	1,579.13	
Cooperative	1,099.25	
Distributive	404.49	
Administration	2,838.23	
University of Michigan		28,997.20
Trade and industry	$7,216.18	
Distributive	21,781.02	
Wayne State University		10,817.98
Trade and industry	$7,732.48	
Distributive	3,085.50	
Western Michigan University		32,578.04
Homemaking	$1,100.00	
Trade and industry	18,941.62	
Cooperative	9,891.89	
Guidance	2,644.53	
Total		133,550.97

Summary of 1956–57 enrollments in reimbursed vocational education classes in State institutions

	Central Michigan College	Ferris Institute	Michigan State University	Northern Michigan College	University of Michigan	Wayne State University	Western Michigan University	Eastern Michigan College	Michigan School for the Blind	Michigan School for the Deaf	Total
Agriculture division: Young farmers			295								295
Business education division:											
Retailing, sales and management			710	13	535	916					2,174
Small business management			388		48	40					2,327
Real estate	1,851		614		3,820						4,434
Insurance			1,583	10	521						2,114
Restaurant, hotel, and resorts			1,971								1,971
Miscellaneous service businesses			721	18	78	51	47				908
Wholesale		23	305		52		21				378
Cooperative occupational training				46			189				235
Trade and industrial division:											
Bus driver training			1,125				1,710				4,006
Custodial training	2,071		1,390								1,380
REA			261								261
Foreman training			580								580
Police training			224			182					406
Grain elevator operation			40								40
Farm machinery service and sales			22								22
Horticulture			116				10				116
Air conditioning mechanics							33				10
Auto mechanics						32	65				33
Drafting							22				97
Electronics: radio and television							26				22
Electronics technician							25				26
Machinist				171	9	369	170				25
Foreman and supervisory training						95					719
Engineer training						12					95
Mechanics: Maintenance and service					1,634						12
Firemanship training				83			30	73	26	72	1,634
Homemaking											284
Total	3,922	23	10,335	341	6,697	1,697	2,348	73	26	72	25,534

Mr. ELLIOTT. Our next witness is Mr. C. W. Patrick, assistant superintendent of schools, San Diego, Calif.

STATEMENT OF CHARLES W. PATRICK, ASSISTANT SUPERINTENDENT OF SCHOOLS, SAN DIEGO, CALIF.

Mr. PATRICK. Thank you, Mr. Chairman.

I am C. W. Patrick. I am assistant superintendent of schools, San Diego, Calif. I am in charge of the junior colleges in San Diego and five adult high schools.

I have spent about 20 years in vocational education, as a teacher, teacher trainer, State supervisor and as a local director.

I also served as director of training for the War Manpower Commission for the west coast.

I hold a bachelor of science degree from California Tech and a master's degree in education. I served 7 years on the Regional Accrediting Committee for the ECPD, accrediting technical education.

I am a member of the national board of directors of the American Technical Education Association and the National Council of Local Administrators of Vocational Education and Practical Arts.

I am going to very briefly summarize my written statement in view of the time.

In California the primary responsibility for the technical-education program which is so badly needed, as described by Dr. Mobley, is placed in the public junior colleges, and I documented this in my written report.

The California system of junior colleges consists of some 61 institutions spread throughout the State and serving nearly every community and area.

These schools enrolled last fall some 81,000 full-time students and 186,000 part-time students. Each school is operated by an independent local board of education, and most of the junior colleges encompass several high schools or even several high school districts so that these are truly area schools.

On the average, a third of the cost of operation comes from State funds and slightly less than two-thirds from local tax moneys. In addition, all the buildings and equipment must be provided through local funds.

I think the San Diego Junior College, as the Los Angeles Junior College has already done, can serve to illustrate the functions of one particular junior college as well as the general junior college system in California.

The San Diego Junior College is a public junior college operated by the board of education of the San Diego city schools. We currently enroll about 3,000 full-time students and somewhat more than 6,000 part-time evening students. We serve not only the city of San Diego, but the surrounding metropolitan areas. Actually, one-fourth of our enrollment comes from outside of our school district. About a thousand of the full-time students, about one-third, are in the so-called technical, semiprofessional and skilled occupations and about half, or approximately 3,000, of the part-time students are employees in industry who are seeking to advance into technical and highly skilled positions.

All of these curriculums and courses are operated in accordance with the State and Federal vocational education laws and under the provisions of George-Barden and Smith-Hughes Acts.

While the proportion of Federal funds that we receive for these programs is small, they have great importance in carrying on the extra costs of vocational education as compared with the more academic programs and in supporting a large share of the cost of our local supervision and leadership.

In addition, we use some 64 advisory committees for these trade and technical classes, including both labor and management.

Our school, as in Los Angeles, operates from 8 o'clock in the morning to 10 o'clock in the evening, with most of the classrooms and shops in use throughout the day.

I have included with my statement an article from a company magazine, the Rohr Aircraft Co., which describes the technical institute program and the part-time educational program offered in the junior college. It does an excellent job of describing these programs.

I have also included a full list of the courses offered in the day and in the evening programs of the junior college. This gives you, I think, an accurate overall view of our entire educational program.

There are more than 1,000 different classes offered, and I think you can see the proportion of technical scientific courses which this school currently offers.

Since all of these classes in technical and vocational education are operated under the direct scrutiny of a local advisory committee of labor and management, I think it is obvious that there is a demand for this kind of training, but in order to verify this further—particularly in the area of technical education—I clipped a group of advertisements from the local morning paper last week which primarily indicate the need for engineers and technicians. I hope you will take the time to look at them and verify that there is such a need even in view of the current lagging employment of factory workers in these very same companies.

Actually, one of the most challenging educational aspects of our current industrial leveling is the increasing proportion of engineers and technicians required in the modern plant.

Last week our junior college staff asked the five major employers in the defense industries in San Diego to provide us with information as to the proportion of employees to engineers and technicians and this is the range they found: For each 1,000 total employees in the plant they had a range from 60 to 200 engineers and from 60 to 180 technicians.

The most impressive item of information in the summary which is in my report is a comparison of Convair's astronautics plant with the others. Astronautics is the new missile plant that manufactures the Atlas, the first successful intercontinental ballistic missile in the world. This plant now has about 200 engineers and about 180 technicians out of each 1,000 employees. They expect to go to 230 technicians and 200 engineers per thousand employees.

I think to a great extent this is the future pattern of our missile and electronic industry in America and it certainly shows the urgent need for training at the technician level.

These five major plants in San Diego, aircraft missile plants, now employ some 7,000 technicians. To this number must be added the thousands of employed in the small electronic plants and subcontractors of the naval installations in our community.

Incidentally, I am sorry Congressman Barden had to leave because many of these technicians have received their training in the Armed Forces where the total cost has been paid by the Federal Government and I do not know what we would have done without it, as a matter of fact. But it has been a more expensive type of training from the Government point of view.

Certainly in order to meet these current and anticipated demands for technically trained workers our junior college is going to have to greatly expand its facilities and its programs. We will need additional equipment and materials. Increased Federal support for operating costs and for equipment will make it possible or will at least stimulate this expansion and help us to meet San Diego's most critical manpower problems.

In my report I detailed the cost of the equipment for just one electronic laboratory. The list is itemized and totals slightly in excess of $40,000.

We are talking at the present time of construction for a material testing laboratory which would cost in excess of $8,000.

We are going to have to add additional drafting rooms with drafting machines which will run in excess of $10,000 each—this for equipment alone.

These are just examples. I could add others.

The Federal funds under the State-Federal boards for vocational education can be made available not only to high schools but to all types of schools engaged in the training of technical workers, particularly to the junior colleges that have this responsibility in California.

The most critical need is for additional funds to expand our equipment, to replace obsolete equipment and to provide the very expensive equipment which is required in technical education programs.

I hope this information on one specific community will be of assistance to the committee in appraising the need for this legislation and if we can do more in providing information from San Diego we will be very happy to do so.

Mr. ELLIOTT. Thank you very much, Mr. Patrick.

Your prepared statement will be entered in the record at this point.

(The statement referred to follows:)

STATEMENT BY CHARLES W. PATRICK ON H. R. 10381

Mr. Chairman and members of the committee, I appreciate this opportunity to appear before you to present evidence of the need for assistance to the States in providing vocational education for the skilled and technical occupations. Vocational education is a matter of national importance and concern, but is administered through the States and local communities across the Nation. It is fitting, therefore, to examine individual communities to ascertain the urgency and desirability of national support of vocational education. I hope this information on the San Diego program will be of assistance in your appraisal of the proposed legislation.

1. INTRODUCTION

This statement has the following purposes:

(*a*) To present the qualifications of the witness as an authority in technical and vocational education.

(*b*) To show that the San Diego Junior College and the California system of junior colleges are now offering throughout the State, in cooperation with the State board for vocational education, effective programs of technical and vocational training—which need to be strengthened and supported by increased Federal aid.

(*c*) To offer specific examples, illustrations, and exhibits which will demonstrate for one community the expanding needs for trained technical and skilled manpower in critical industries, the costs of equipping and operating technical training programs, and the cooperation of schools and industry.

(*d*) To show that in the State and Federal boards for vocational education there now exists the machinery for the effective distribution of additional Federal funds for promotion and extension of technical education at any level of education, but particularly through the junior or community colleges.

2. QUALIFICATIONS OF THE WITNESS

As assistant superintendent in charge of post-high-school education for the San Diego City schools, I am responsible for the San Diego Junior College and 5 adult high schools.

During the past 20 years, I have been in vocational education as teacher, teacher trainer, State supervisor, and local director. During World War II, I served as regional director of training for the War Manpower Commission for the 5 Western States.

I hold a bachelor of science degree in science from the California Institute of Technology and a master of arts degree in education.

For the past 7 years I have served on the region VIII committee, technical institute accrediting program of the Engineers' Council for Professional Development. I have served on the national board of directors of the American Technical Education Association and am currently a member of the board of directors of the National Council of Administrators of Technical Education and Practical Arts.

I am representing the San Diego city schools, the SanDiego Junior College, the California Industrial Education Association, and the American Vocational Association.

3. THE CALIFORNIA JUNIOR COLLEGE SYSTEM

A. Technical education a junior-college function

In California the primary responsibility for the formal training of technical and skilled manpower has been placed on the public junior colleges.

A survey of the needs of California in higher education, prepared in 1948 for the liaison committee of the University of California and the California State Department of Education, stated: "In any vocational or professional field a group of workers is needed beginning with the unskilled and semiskilled and ending with the highly professional and research type. The unskilled and the semiskilled learn what they need to know by the pickup method. Skilled workers become such through apprenticeship or by mastering courses on the high-school level. Technical programs have in California long been regarded as the province of the 2-year junior college, while professional training is the province of the university." [1]

A more detailed statement comes from a followup study in 1955:

"*Vocational curriculums.*—One of the most valuable and distinctive functions of the junior colleges in California is the provision of technical and semiprofessional curriculums. Numerous studies have in-

[1] A Summary of the Needs of California in Higher Education. Sacramento: California State Department of Education, 1948. Pp. 26, 27.

dicated in recent years that America's industrial and technological economy requires more workers at the technical than at the professional level. In the field of engineering, for example, estimates have ranged from a ratio of 6 technicians to 1 professional engineer, to as high as 16 to 1. Studies in New York State and elsewhere which have involved a very careful analysis and tabulation of trade and industrial occupations have shown that the same high proportion of semiprofessional workers is needed in other occupations as in engineering. In an expanding national economy, and particularly in a State such as California, where the growth potential is much higher than the average for the United States as a whole, technical personnel will be in increasing demand.

"The technical-vocational curriculums of most California junior colleges are excellently planned and appear to be well organized and taught. Lay advisory committees draw from the occupations in question aid in planning vocational offerings.

"Junior-college technical curriculums also often include a cooperative work plan in which the student is actually employed for part of the school day as part of his education. Junior colleges also frequently conduct surveys of the occupational needs of the communities they serve as a basis for setting up new curriculums or revising existing ones.

"Representatives of business and industry are increasingly aware of the value of the vocational training provided by the junior colleges. The Merchants and Manufacturers Association of Los Angeles conducted a junior college curriculum evaluation study in April 1954. An officer of the association, in a letter to a member of the restudy staff, made the following comment on vocational education in the junior college:

" 'Over the years we have seen a constant rise in the skill levels demanded by business and industry. Tomorrow or the day after, with the increasing uses of automation, the substituting of electronic "brains" and their manipulations for today's manual and machine operations, these skill levels will skyrocket. Many job classifications, important today, will be replaced by new job families—some of which we only faintly recognize as yet.

" 'Business and industry will get their scientists, engineers, and professional management people from that 15 percent who will be graduated from 4-year colleges and universities. We shall have to depend on the bottom end of the scale, the 70 percent, for the "hands."

" 'Query: Where are we going to get the technicians, the subengineers, the service people, the leadmen, foremen, and the supervisors?

" 'In my mind, the best place to get them is from the 2-year terminal courses in business and in vocations offered by the junior colleges.'

"The spot-check study conducted by the association gave the following comments of management with regard to the effectiveness of the terminal-vocational training which had been secured by junior-college gradutes in their employment:

"Effectiveness:	*Percent*
Better prepared for the job	71.2
Better beginning job	61.3
Advantages in promotion	60.9
Present job related to major course	[1] 88.8"

[1] A Restudy of the Needs of California in Higher Education, prepared by the liaison committee of the regents of the University of California and the California State Department of Education, Sacramento, California State Department of Education, 1955, pp. 56, 57.

B. Administration and support of the California junior colleges

The California system of junior colleges consists of 61 public junior colleges serving nearly every area and community throughout the State and enrolling as of October 31, 1957, 81,112 full-time students and 186,249 part-time students and adults. Each junior college is operated by a local board of education. Most junior-college districts encompass a number of high schools and high-school districts, so that the junior college in California truly serves as an area school. On the average, one-third of the operating cost of the junior colleges comes from State funds and slightly less than two-thirds from local funds. In addition,

all building and equipment must be provided by local funds. In 1953–54, 3.1 percent of the income of the junior colleges came from Federal funds—primarily from the Veterans' Administration and from Federal vocational education funds.

C. Junior colleges offer technical training using vocational education funds

As has been described in the surveys of higher education in California, the junior colleges have been doing an effective job in attempting to meet the need of the State for trained technical and highly skilled workers. Last year, for example, there were offered in California some 736 full-time courses in occupations which are cataloged as critical to our defense production at the present time—such as aircraft, electronics, machine shop, tool and die, etc. There were 54,890 persons enrolled in part-time evening classes in these fields. These totals include some evening high-school classes. All of these classes are operated in accordance with State and Federal programs of vocational education.

4. THE SAN DIEGO JUNIOR COLLEGE AS A REPRESENTATIVE OF THE STATE SYSTEM

In lieu of general information about the statewide program, it seems more appropriate to describe in some detail the specific program of the San Diego Junior College.

A. Administration and support

The San Diego Junior College is a public junior college operated by the board of education of the San Diego City schools. It currently enrolls nearly 3,000 full-time students and 6,000 part-time students. It serves not only the San Diego School District but, also, the surrounding metropolitan area and suburban communities as an area technical school. More than one-fourth of those enrolled reside outside of the San Diego School District. Approximately one-third of the full-time students are enrolled in 2-year curriculums preparing for specific employment in technical, semiprofessional, and skilled occupations. Almost half of the part-time students are employees in industry who are seeking to improve and advance themselves in skilled and technical occupations. All of these curriculums and courses are operated in accordance with the State and Federal vocational-education plans and receive support from Smith-Hughes and George-Barden funds. Total Federal vocational-education funds received last year equaled $46,618.07 against the junior-college operating budget of $1,560,644.

B. Cooperation with industry, labor, and management

All training for technical and skilled occupations in the San Diego Junior College is established and operated with the cooperation and assistance of 64 advisory committees, including both employers and employees. Many of these committees meet monthly. Local industries are closely involved and deeply concerned with the training programs. For example, at their request, each of the four major local aircraft companies is sent, each semester, a report on each employee enrolled in a part-time technical curriculum, showing the course attended and grades. This information becomes a part of the employee's record.

Attached as appendix A is an article from the September 1955 issue of the Aerohrcrafter, the Rohr Aircraft Co. publication, describing one phase of the San Diego Junior College program.

Most instructors in the part-time evening classes are employed in industry during the day and have been selected and recommended by industry to teach these classes.

C. Electronic technician training in San Diego

As previously stated, the San Diego Junior College enrolls approximately 1,000 full-time day students in programs providing specific preparation for technical and skilled employment, and nearly 3,000 part-time students in evening classes in skilled and technical occupations. Classes operate from 8 a. m. to 10 p. m., with most of shops and classrooms in full use, day and evening. In order to accommodate the huge part-time enrollment, the San Diego Junior College also utilizes facilities of several of the city high schools in the evening and offers classes in industrial plants where employees can attend after their workday is completed.

Because of the well-known and critical need for electronics technicians, a detailed breakdown of the courses and enrollment in this field is provided:

Full-time day program.—There are four specialized curriculums offered in the electronics technicians training: General (research and manufacturing) electronics; industrial electronics; electronic communications; radio and televi-

sion. There are currently 179 full-time students enrolled in these 4 curriculums.

Part-time evening program.—These same four curriculums are available during the evening on a part-time basis for persons already employed in the electronic field as semiskilled workers or assemblers. Five classes are offered, enrolling 127 persons.

In addition, introductory, specialized, and in-plant classes in electronics offered by the San Diego Junior College include the following:

Programs	Number of classes	Enrollment
Astronautics plant, electronics	3	78
Convair, electronics (apprenticeship and trade extension)	8	231
Solar Aircraft, aircraft electronics	1	25
Industrial electronics (basic)	2	55
Electronics, subassembly	3	76
Radio communications license review	1	23
Mathematics for electronics	1	24
Drafting for electronics technicians	1	24
Total	20	536

Added to the 5 classes for the electronics technical institute, this totals 25 classes enrolling 663 persons.

Similar statistics could be provided for areas such as tool design, tool planning, inspection, aircraft manufacturing, drafting, and engineering technician. Enrollment in these fields has literally exploded in the past few years and the demands continue to increase.

D. Projected expansion in electronics training

Because the San Diego Junior College just moved in September 1956 into a new $1,600,000 plant, it has been possible so far to keep up with student demands and expanding placement opportunities. Next year, however, there would be provided training for 100 to 125 additional full-time students, primarily in general (research and manufacturing) electronics. This will require an additional laboratory or shop. By operating these shops up to 8 hours per day, 4 day classes can be accomodated, as well as evening classes 5 nights per week.

In the evening part-time program, an expansion of 21 electronics classes, enrolling an additional 525 students, is projected for next year.

E. Need for additional equipment

In order to illustrate the costs of expanding technical education, the following detailed list of the equipment required for an additional general electronics laboratory is presented:

San Diego Junior College—Equipment and material for general (research and manufacturing) electronics laboratory

Number and description	*Price*
4 amplifiers, AF, at $159.60	$638
1 amplifier, magnetic (Vickers or equal)	120
3 audiofrequency oscillators, at $565	1695
4 AC vacuum tube voltmeters, at $250	1000
1 antenna bridge	250
1 AM-FM tuner	169
12 vacuum tube voltmeters, DC, at $59.50	714
1 DC fundamentals crow kit	148
1 AC fundamentals crow kit	148
1 counter, pulse	1300
2 capacitance-resistance bridge and analyzers at $71.50	143
1 communications receiver, AM	224
1 lecture demonstration unit (similar to Philco trainer), include 12 laboratory circuit analysis units)	7344
1 electronic switch	149
3 decade boxes, resistance, at $50	150
3 decade boxes, capacitance, at $50	150
3 decade boxes, inductance, at $50	150

San Diego Junior College—Equipment and material for general (research and manufacturing) electronics laboratory—Continued

Number and description	*Price*
Miscellaneous etched and printed circuit material	$250
1 UHF frequency meter	1100
1 VHF frequency meter	1100
1 field strength meter	365
1 flying spot scanner (modulated TV signal)	300
2 grid dip meters with HF probe, at $99	198
2 impedance bridges, at $495	990
2 marker generators—VHF, at $125	250
1 motor generator set (½ HDAC to DC), 20-volt	450
6 microphones, at $20	120
12 oscilloscopes, wide band (3 cycles per second to 4.5 megacycles)	2874
1 oscilloscope, wide band demonstrator	900
2 phono pickup and turntables, a $87.50	175
4 oscilloscope calibrators, at $49.50	198
20 panel meters, miscellaneous (ac and dc), at $11.40	228
2 pulse generators, at $450	900
1 radio demonstrator	150
12 regulated power supplies, at $150	1800
6 Volt-Ohm millameters (20,000) at $68	408
6 variable voltage power supplies, at $150	900
1 speaker enclosure	250
8 signal generators, standard, at $95	760
1 signal generator, VHF	950
2 sweep and marker generators, at $325	650
2 Servo amplifier systems kits, at $98.50	197
2 square wave generators, at $195	390
1 close circuit television system (components only)	950
Miscellaneous telemetering devices	750
1 tube tester and transistor tester	170
1 AM transmitter and modulation unit	138
1 set wave guides	750
Miscellaneous electronic components (wire, vacuum tubes, coils, condensers, transformers, etc.)	6500
Miscellaneous hand tools (drill press, soldering irons, screwdrivers, etc.)	
Miscellaneous workbenches, tables, chairs, etc.	
Total	40, 603

Similar expansion of facilities is needed in the other technical training fields such as tool planning, tool design, and engineering technician training. Specific equipment needs which must be met to provide the expanded programs include a technical testing laboratory, estimated at $80,000, and drafting rooms, estimated at $10,000 each for equipment alone.

5. INDUSTRY'S DEMAND FOR TECHNICIANS

One of the most important and challenging aspects of the current industrial revolution to education is the greatly increasing proportion of engineers and technicians required to man the modern plant.

This trend can be vividly illustrated in San Diego.[2] The junior college staff, on March 4, 1958, asked five major local employers engaged in critical defense production to provide information on the proportional employment in their plants of engineers, technicians, and factory workers.

The following definition was used by the plants to identify technicians:

[2] Appendix B includes advertisements clipped from the San Diego morning paper of March 4, 1958, and shows the continuing need for engineers and technicians in the face of generally declining factory employment.

Because of the current reductions in employment of factory workers, there is an increased interest in full-time training and an expansion of junior college enrollment. The present situation offers an excellent opportunity for expanded full-time training to meet critical current and future manpower shortages.

"The Technician

"The technician is a person who works at a job which requires applied technical knowledge and applied technical skills. His work, in this respect, is somewhat akin to that of the engineer, but usually the scope is narrower. His job also requires some manipulative skills—those necessary to handle properly the tools and instruments needed to perform the technical tasks. In his field he has considerable technical knowledge of industrial processes, and in his field he knows how to apply the necessary principles of the physical sciences and mathematics. In general, he uses instruments, in contrast to tools. His contribution is mainly through mental effort in contrast with muscular exertion." (Bulletin No. 1131, U. S. Dept. of Labor)

The chart below presents in summary form the information obtained from these five plants, showing for each 1,000 total employees the number of engineers and the number of technicians:

Number of engineers and technicians in each 1,000 total employees

Plant	Technicians	Engineers
Convair	167	109
Convair—Astronautics:		
Present	180	200
Planned	230	200
Solar Aircraft Corp	62	91
Ryan Aeronautics	110	83
Rohr Aircraft Corp	128	63

It is encouraging to note the progress these plants have made in utilizing technicians to help meet the critical shortages of engineers. Further progress would be achieved if fully adequate training for technicians could be provided. Nearly all of the plants have utilized formal in-plant training programs to develop technicians, in addition to the full-time and part-time programs of the San Diego Junior College.

The most impressive information from this chart is the comparison of the astronautics plant with the other four. Here is the missile plant, home of the Atlas, now employing 200 engineers and 180 technicians in each 1,000 workers and moving toward an ultimate employment of approximately 1 technician or engineer for each other employee. To a great extent, this is the future pattern of our missile and electronic industry and shows the urgency of expanded technician training.

These 5 plants, currently employing nearly 50,000 persons, now require 7,000 technicians. The proportion or ratio of these workers is increasing. It seems evident that in San Diego, at least, the training of technicians is an important and continuing task, essential to our defense production efforts.

Further promotion and expansion of vocational-technical education to meet these needs is of paramount concern, not only to the local community but to the Nation as a whole.

It is worth noting "that for Soviet industry as a whole the number of trained engineers and technicians per 1,000 production workers over the 20-year period from 1930 to 1950 increased more than fourfold." [3]

The DeWitt report describes a ratio of technicians to engineers in industry as 17 to 10 [4] and notes that, for 1950, in certain branches of machine building, the number of engineering-technical personnel per 1,000 production workers exceeded 200.[5]

6. COOPERATION OF EDUCATIONAL INSTITUTIONS IN SAN DIEGO

The San Diego Junior College, the San Diego State College, and the University of California, through its extension division, have clearly defined their respective responsibilities for education and training in the engineering and technical occupations in the San Diego area. The San Diego Junior College has the responsibility for the technician's training. Appended is a recent

[3] DeWitt, Nicholas, Soviet Professional Manpower. Washington, D. C.: The National Science Foundation, 1955. P. 249.
[4] Ibid., p. 245.
[5] Ibid., p. 250.

bulletin jointly published by these three educational agencies, describing the opportunities for advancement in engineering and technical fields through part-time evening classes, and illustrating the scope of offerings and the cooperation which exists.

7. ADMINISTRATION OF FEDERAL FUNDS FOR TECHNICAL EDUCATION

All of the programs of training for technicians and skilled workers provided in the San Diego Junior College—full time and part time—are operated under the State and Federal plans for vocational education. The patterns, policies, and procedures which have been established under these authorities are effective and flexible enough to provide for the development of programs and courses designed to meet local needs but also conforming to desirable State and National standards.

Federal funds administered under the State and Federal boards for vocational education can be made available, not only to high schools, but also to all types of post-high-school institutions including junior colleges and even 4-year colleges engaged in the training of technicians and skilled workers.

The critical need is for additional funds for increasing the proportion of Federal support and aid and for the purchase and replacement of equipment and materials for technical education programs.

Approximately $300,000 of the $1,560,444 annual budget of the San Diego Junior College is spent for the training of skilled and technical workers. Less than $50,000 of this budget is provided from the present Federal acts for vocational education. No Federal funds are available for the purchase or replacement of equipment, a major item and problem in providing adequate technical education.

8. SUMMARY

In California, the responsibility for the training of technicians has been placed in the public junior colleges. In San Diego, the junior college, operating all of its technical training under the State and Federal plans for vocational education, is providing an effective program of training for technical workers for industries critical to our national defense effort. The 5 major aircraft and missile plants in San Diego already employ 7,000 technicians and the number and proportion is increasing. To this must be added the technical workers in the naval electronics laboratory, the naval air station, the National Steel & Shipbuilding Co., and the scores of small electronics manufacturers and subcontractors. In order to meet current and anticipated demands for technically trained workers, the San Diego Junior College must greatly expand its program, providing additional facilities, equipment, and materials.

Increased Federal support for operating costs and for equipment and materials will make it possible to provide this expansion and to meet in San Diego one of the most critical manpower problems facing our defense plants.

In the State and Federal boards for vocational education there now exists the machinery and procedures for effective distribtuion of these additional Federal funds for the promotion and expansion of technical education at any level of education, but primarily in the junior or community colleges and technical schools throughout the Nation.

It is our hope that this information will be of assistance to the committee in the review of the proposed legislation. The San Diego Junior College will be willing to provide additional informtion and to assist in any way the efforts of the committee in order that appropriate action may be taken as soon as possible.

APPENDIX A

[From the Aerohrcrafter, September 1955]

SCHOOL FOR AIRCRAFTSMEN—TECHNICAL INSTITUTE OFFERS NUMEROUS COURSES

The Aircraft Industries Technical Institute, which starts its fourth year this September, is a logical development in San Diego—with its record of many firsts in the field of aviation.

The institute is the first of its kind in the United States—the first school, that is, to be devoted almost entirely to courses on the manufacture of airplanes.

Actually the institute isn't a separate school in itself, but is part of San Diego Junior College. Institute courses, listed in the San Diego Junior College bulletin, are given in the classrooms of the Vocational School, 348 West Market Street, and in the junior college buildings on 12th Street.

Organization of the technical institute was based on this assumption: San Diego's economy is closely tied in with aircraft manufacturing and maintenance. To put this another way—more San Diegans draw their pay from aircraft companies than from any other source.

The institute came into being when, in 1952, representatives from the San Diego city schools and the aircraft industry met to discuss a way of providing vocational education for the people who worked in aircraft plants.

The men who attended this meeting decided that the aircraft industry, because of its size and complexity, merited a full-scale technical institute. They decided also that the emphasis of the institute would be on promotion and upgrading, that the courses would deal with more advanced technical phases of aircraft work, so that they would provide opportunity for people who wished to upgrade themselves within the aircraft industry.

Since that first meeting, the management of the institute has been a joint enterprise. Major and minor decisions about courses, instructors, or other institute matters are made at regular advisory committee meetings, during which training people and manufacturing specialists from the aircraft plants get together with administrators from the city schools. The actual administration of institute courses is done by the city schools.

The institute started by offering a group of courses in aircraft inspection. Gradually more courses were added until, finally, students could choose from an entire field of study devoted to aircraft inspection. In fact, if he wants to, a student can work toward a junior college degree in aircraft inspection. In the past few years four new fields of study have been added to the institute's offerings. These are: aircraft tool planning, aircraft tool design, aircraft manufacturing, or aircraft accounting. Many courses are included in all five fields of study, but each field of study includes specialized courses as well.

Suppose, for example, an aircraft employee decides he wants to gain an educational background which would make him more eligible for a position in the inspection department. He would probably choose to major in aircraft inspection and would take some of the following courses: Inspection math, blueprint reading, aircraft materials, aircraft materials processes, inspection instruments, detail inspection, subassembly inspection, major inspection, field and service inspection, manufacturing processes, plant organization, quality control, human relations, special inspection instruments, and technical English. Courses are given on a semester basis, and normally the working student would find it difficult to take more than 2 courses each semester, since each course includes approximately 60 hours of classroom work plus the same amount of homework.

If the student decides to work for a junior college degree—called an associate of arts—he has to take some courses, such as political science, which are required by the State of California. But no student has to work toward a specific degree in the institute. Aircraft employees can take courses to review material they have previously learned but partially forgotten; they can take single subjects in order to gain more knoweldge in a specific field; or they can work toward certification in a specific field of study by taking a prescribed number of units.

The organization of institute courses is based on the idea that San Diego will continue to be one of the world's largest centers of aircraft manufacturing. Consequently, there will be a constant demand for highly trained people in the aircraft plants. This demand will be felt most in the skilled trades and technical groups, such as inspection, tool making, tool design, tool planning, etc. Institute courses are not set up to do short-term training for specific jobs.

Because most aircraft employees work day shifts, the institute offers more courses at night than in the daytime. A typical 3-unit course, for example, will run 2½ hours a night, 1 night a week, during the school semester. At present the institute offers courses only during the fall and spring semesters of the regular school year, but it is possible that some summer session courses will be given in the future. Only people who work in the aircraft industry can enroll for institute courses. They pay no regular tuition, but the institute charges a small fee for each course and students have to buy their own books and materials.

Students attending institute courses recognize sooner or later that the instructors are mostly specialists from the aircraft plants in this area—men who work full time at their regular job and then spend one or more nights a week teaching others the fundamentals of their specialty. The advantage of having instructors from the aircraft industry is obvious; they are more familiar not only with the subject matter, but also with the day-to-day problems that come up during the manufacture of airplanes.

The success of the institute is best shown by the number of students taking its courses. During the spring semester of 1955 more than 350 students took

courses given by the institute. And many of these students have been going to the institute since it first began.

Executives and department heads in many of the aircraft plants have commented on the effectiveness of the institute courses in aiding employees to learn some of the more complex aspects of aircraft manufacturing. At most of the aircraft plants—and this is true at Rohr Aircraft Corp.—the training departments keep a record of people enrolled in institute courses. Once students complete courses successfully, the record is entered in their personal folder, and a copy is sent to their department heads.

But the best indication of the success of the institute is this: Many employees who entered courses at the institute have since been promoted to jobs with better pay offering better opportunity for the future. This fact shows once again that opportunity comes first to people who have prepared themselves to meet it.

APPENDIX B

A TYPICAL COLLECTION OF ADVERTISEMENTS FOR TECHNICAL AND PROFESSIONAL MANPOWER IN THE SAN DIEGO UNION March 4, 1958

Plaster
Pattern Makers
Immediate openings for top class A men
Profit sharing, paid vacations, many other company benefits. Career opportunity.
SOLAR
AIRCRAFT COMPANY
PACIFIC HWY. AT HAWTHORN
MON. THRU FRI.
9 to 11 A.M.—1:30 to 3:30 P.M.

Mr. ELLIOTT. And thank you very much, Dr. Mobley.

The testimony that you have given us this morning has been very helpful. I have heard it with interest and I deeply appreciate your getting it together and presenting it in such an admirable and interesting fashion.

The subcommittees will stand in recess subject to the call of the Chair.

(Whereupon, at 12:55 p. m., Monday, March 10, 1958, the subcommittees recessed subject to the call of the Chair.)

SCHOLARSHIP AND LOAN PROGRAM

WEDNESDAY, MARCH 12, 1958

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPECIAL EDUCATION
AND SUBCOMMITTEE ON GENERAL EDUCATION,
COMMITTEE ON EDUCATION AND LABOR,
Washington, D. C.

The subcommittee met, pursuant to recess, at 2 p. m., in room 429, Old House Office Building, Hon. Carl Elliott presiding.

Present: (Subcommittee on Special Education Representatives Elliott (chairman) and Green.

(Subcommittee on General Education) Representatives McGovern, Frelinghuysen, and Lafore.

Also present: Representative Perkins.

Staff members present: Mary P. Allen, clerk (Subcommittee on Special Education).

Mr. ELLIOTT. The subcommittee will be in order.

Our first witness this afternoon is Representaitve Adam Clayton Powell. Mr. Powell is a member of the full Committee on Educatiton and Labor. In addition, he is the sponsor of a bill pending before this subcommittee; namely, H. R. 5030, which would increase the supply of scientific and technical manpower in the United States by providing a system of scholarships for college and graduate level study of scientific subjects.

The committee will be happy to hear you and you may proceed in any manner you see fit.

STATEMENT OF HON. ADAM C. POWELL, JR., CONGRESSMAN FROM THE 16TH DISTRICT OF THE STATE OF NEW YORK

Mr. POWELL. Thank you, Mr. Chairman. I usually start off by complimenting the eminent and distinguished chairman for his bills, and I want to that and do it sincerely, because I think the bill you have before this committee is the bill—all of the bills, mine included, notwithstanding.

I would just like to file these words with the committee. On January 13, 3 years ago, I introduced a bill along with my colleague, Congressman Osmers, of New Jersey, for a crash program for science education. I based this bill upon a series of articles written by Dr. Benjamin Fine in the New York Times, in which he pointed out in 1954 that Soviet Russia had already overtaken us and if we did not adopt their program of science education, we would definitely be

passed. In my opening speech as recorded in the Congressional Record, on January 13, 1955, on the introduction of the bill, I stated,

If this legislation does not become law, within 3 years we will become a second-class technological power.

This has just about come true; I missed it by 3 months.

I am in favor of the Hill-Elliott bills. I would suggest, however, that some changes be made. I would suggest that the legislation be worded very carefully so that the word "engineering" is included along with the word "science."

In the second place, I would suggest that there be no discrimination on the basis of sex spelled out in the bill, because there is a feeling that science education and engineering education are restricted to men only.

I would further suggest that there be an amendment that this program be administered without regard to race, creed, color, or national origin. This would not bring up the matter of integration or segregation, because under this bill the students have the right to pick whatever college or institution they desire to go to.

It is interesting to point out in connection with this that some of the major scientific contributions being made by our country today are spearheaded by scientists and engineers not born in the United States. It is academic to talk about the Powell amendment because I am sure that we have now come to the place in our thinking where we realize that we cannot be the equal of, much less surpass, Soviet Russia with an all-white society. We need today the complete marshaling of all of our forces irrespective of their color, their race, or their creed, or their national origin, or their sex.

I would like to also add that in view of the present recession, these bills, your bill, are more mandatory than ever before. The present programs of combating recession as offered by our Democratic colleagues in the other body and by the White House are absurd. It is actually stupid to try to say that you can combat a temporary recession which now has labor at its highest unemployment peak in 16 years with a program of public works, when the man in the street knows that a program of public works would take at least 2 years before a dollar of it filtered down into his pocket. We need quick aid now. This bill takes on double proportions as part of the program to pump some green plasma into the financial bloodstream of American citizens. We need also—and this is beside the point—immediate tax reduction, higher maximum benefits under the Social Security Act and the Federal Unemployment Insurance Act, prolong the duration for benefit payments, coverage of employees of small business.

Mr. ELLIOTT. Does the gentleman have the latest figures on unemployment that he could read into the record at this point?

Mr. POWELL. The latest figures I have are those of yesterday—the highest unemployment in 16 years. The highest unemployment in the United States in 16 years.

Finally, I would like to say, although it is not quite germane to this particular bill, that our whole program of Federal aid for school construction is putting the cart before the horse. I am in favor of Federal aid to school construction, but I cannot see how it is possible

nor logical to feel that you can solve the problem of education by building new school buildings when already we have empty classrooms and 135,000 classrooms being manned by substandard teachers. I will go along with all school-aid construction bills, as long as they have the Powell amendment in them. In this respect, I would like to thank Mr. Roosevelt for introducing the Powell amendment to Public Laws 815 and 874. It was defeated last year by only five votes. I think it can be passed now.

I think it is very important that the White House change its views concerning methods to combat recession and include in the stated program of public works, school construction.

However, I repeat, all of these suggestions are absolutely ridiculous unless we face the problem of teachers. As of Friday, according to the NEA and HEW, there were 1,240,424 schoolteachers in the United States and 135,000 of them were substandard. Some States, such as Mississippi, and Nebraska, the average salary of teachers was under $3,000 a year. I am proposing a new bill, which I am drawing up now, to present next week which will be a crash program of giving incentives for young people to go into teaching, incentives for those who have retired to come back, incentives to those who are now teaching to pursue graduate work this summer, and also a crash program of putting money on the streets of America now while it is needed.

I am presenting a bill next week to give each and every teacher $500 in addition to the pay now being received from their State agencies. This would put $700 million on the streets of America within the next 2 or 3 months if it is passed by Congress and I see no reason why it should not be passed. The issue of segregation-integration would not come up because the money would go to each and every teacher, black and white, throughout the country.

I realize I have wandered around, but this whole program has been sharpened by the recession. And I think in addition to the need for science education and teacher training and incentives, we now have the need of combating the recession, and this program would put billions on the streets. And I associate myself with it 100 percent.

Mr. ELLIOTT. The gentleman is familiar with the fact that my bill provides for scholarships in one title and an equal number of loans in title 2, and that the loan program provides further that teachers may repay their——

Mr. POWELL. I have that underlined here—that you discount them 20 percent a year, for 5 years—a marvelous idea. I have that underlined on page 2 of the analysis.

I think the White House bill is woefully inadequate in this situation, and I think it should not even be considered. I think this is the only sensible approach to it.

Mr. ELLIOTT. The gentleman from South Dakota, Mr. McGovern.

Mr. MCGOVERN. Mr. Chairman, I am sorry I didn't hear all of the gentleman's statement. I appreciated what I did hear, and I certainly want to commend him for trying to direct our attention to the value of school construction and educational assistance, not only because it is needed in its own right, but because of what it can do in countering the recession. I personally think this is a lot more constructive step than trying to combat the recession by building post offices.

Mr. POWELL. Absolutely.

Mr. ELLIOTT. The gentleman from Kentucky.

Mr. PERKINS. Nothing, Mr. Chairman. I am glad the gentleman from New York appeared before the committee.

Mr. ELLIOTT. The gentleman from Pennsylvania.

Mr. LAFORE. Mr. Chairman, I too am sorry I did not have the opportunity to hear all of the testimony, but I was glad to hear what I did. I am interested, Mr. Powell, in your $500. Is that a one-shot program?

Mr. POWELL. One-shot program.

Mr. ELLIOTT. Do you have additional material that you desire to go into the record?

Mr. POWELL. I would like the privilege of revising my remarks.

Mr. ELLIOTT. Without objection, the gentleman may extend his remarks, revise, and extend his remarks at this point in the record.

STATEMENT OF ROBERT R. MARTIN, SUPERINTENDENT OF PUBLIC INSTRUCTION, FRANKFORT, KY.

Mr. ELLIOTT. Our next witness this afternoon is Dr. Robert Martin, State superintendent of instruction, Frankfort, Ky.

We thank you on two accounts, Dr. Martin. First, for your willingness to be with us, and secondly, for your willingness to wait until this afternoon.

Now, we had a situation arise this morning that made it impossible for this subcommittee to sit. We are all members of the full Committee on Education and Labor, and that committee had before it in executive session the extension of Public Laws 815 and 874, and we could not be at both places at the same time. So we do appreciate your kindness.

Mr. MARTIN. Mr. Chairman, and members of the committee, I will wait here until day after tomorrow, if it would help you, of course, in your consideration of Public Laws 815 and 874.

I had the privilege of a month or 5 weeks ago of appearing before this committee or a similar subcommittee of this committee in behalf of extensions of those laws, and I certainly appreciate the opportunity to come back here today and discuss with you some of the needs, as I see it, for the improvement of education in this country, and more especially in Kentucky.

Mr. EILLOTT. Give us a little background of your educational background, Dr. Martin.

Mr. MARTIN. Of course, I am native Kentuckian. I served in the department of education the last 10 years, and in the last 2 years I have been superintendent of public instruction by election of the people in the State of Kentucky.

I served as a high-school teacher, a high-school principal, I was director of finance in the department of education, and various other jobs before I ran for election as superintendent of public instruction.

I have a statement here. I do not want to read this statement, but I do want to refer to it and will submit the statement.

Mr. ELLIOTT. Feel free to proceed in any manner you see fit, Doctor. We will be glad to hear you.

Mr. MARTIN. When the first satellite was launched last October, there was a great hue and cry directed at the inadequacy of American

education. Like many another crisis, as the months passed, the concern about the Nation's educational problem diminished with the result that the Congress is once again considering various measures, most of which fail to recognize the basic deficiencies of our system of education.

The President, in his budget message, made it quite clear that he had abandoned the school-construction program and was substituting "a broad temporary program of aid to education which is largely science-oriented."

In almost apologetically sending this program to Congress, the President stressed the fact that the program was a stopgap one, and that it was designed so as to allow the States, local districts, colleges, and universities to continue after Federal support was withdrawn.

Thus, again, there is a basic conflict, because I do not believe that it contemplates Federal assumptions of responsibility for meeting the educational problem in the Nation.

This has been called the President's program, a billion-dollar program, but it is rather interesting to me that in the next year it would require only $145 million, as compared to $451 million, which was proposed a year ago, for schoolhouse construction.

So, in the time of the great crisis in the Nation, instead of continuing even at the level of last year, $451 million, we have a proposal which has been called a billion-dollar program, but which contemplates the expenditure by the Federal Government of $145 million.

I think that really if you are going to look at this problem of education there are really 2 basic inadequacies of education in this Nation, 2 problems that we need to solve. If we solve those two problems, I think we have solved the basic ones, and we have done something about the quality of American education.

The first of those problems is the shortage of qualified teachers who are trained in the subjects they are teaching, and the second one is a lack of classrooms which will provide the minimum standards of health, safety, and comfort to pupils.

And, of course, those 2 things, those 2 problems, are the basic ones.

If I may talk about our home State of Kentucky——

Mr. ELLIOTT. Dr. Martin, before you get to Kentucky, let me ask you this general question.

Mr. MARTIN. Yes, sir.

Mr. ELLIOTT. Somebody has alluded to the fact, in these hearings, that some studies have been made that indicate the woeful state of unpreparedness of science teachers in particular States, in the high schools of those States.

But nobody has been able, as yet, to pin it down for the record. Are you familiar with any particular study that would show that of so many—we will say 1,000 places for high school science teachers, that only 500 of them, or less, had studied the particular subject that they taught in college?

Mr. MARTIN. I propose to make reference to that in my testimony for our own State. We have done it in a study of the preparation of teachers in our high schools.

As I mentioned, at the time of Pearl Harbor, we in Kentucky were employing 18,800 teachers who met full certification requirements. We had at that time an oversupply of qualified teachers in the State.

Beginning the next year, however, we began to run out of qualified teachers, and employed 164 emergency teachers. And then this worsened year after year until 1947–48 we employed 5,300 emergency teachers, teachers who were not fully qualified to teach. We began to cut the number down. We cut it down in 1954 to 2,300. But unfortunately, in the last 2 years the numbers increased back up to 3,000 again, out of a total number of teachers of some 24,000.

Mr. ELLIOTT. The Chair recognizes the Congresswoman from Oregon.

Mrs. GREEN. Dr. Martin, what do you mean by an emergency teacher?

Mr. MARTIN. I mean a teacher—and generally speaking our emergency teachers are teachers who maybe are out of high school with 6 or 8 semester hours of college work. That is generally the type of qualification we have.

Mrs. GREEN. Well now, in Oregon we have what we call the emergency certificate, but it may be a person who has a university degree or a master's degree, and yet has not completed maybe 1 or 2 subjects that are peculiar to Oregon.

Mr. MARTIN. There are very few of those we have, although by State board of regulation we have made provisions for those—we have issued them a regular certificate with a professional commitment to make up the shortage that they may have over a 2-year period.

So there are not so very many of those college graduates who would be in this list. They are just substandard teachers any way you look at them. We still give to elementary teachers temporary certificates to teach on 2 years of college.

So by and large, these 3,000 teachers have less than 2 years of college preparation.

Mrs. GREEN. Other States taking your best teachers?

Mr. MARTIN. Of course, that is the thing we do best, train teachers for other States.

Mrs. GREEN. Is it because the other States pay higher salaries?

Mr. MARTIN. That is part of the reason. That is the main reason, I would say.

This does not mean we have not prepared teachers in Kentucky. During the last 10 years approximately 16,000 graduates of Kentucky colleges have qualified as elementary and secondary teachers. However, at the same time 20,000 teachers have withdrawn from the retirement system, have quit the profession, or accepted positions in other States as teachers.

If I may digress from this, we trained on the average some 2,000 teachers annually, fully qualified teachers, and until about 2 years ago we were keeping 800 of those to teach in Kentucky schools and 1,200 of them were going elsewhere to teach in Ohio, Florida, Georgia, or Virginia, or Missouri, or Illinois.

Such a mass exodus is due in the main to one factor; salaries. This has occurred in spite of the fact that we now have a foundation program, and we have materially increased our support for public education by an additional 20 million in 1956–57, and an additional 23 million this year.

But the loss of teachers affects the quality of education and even more important is the adverse effect on the quality of the program offered.

For example, we have read in the public press in recent months statements which purport to show that secondary pupils do not take science courses. The facts do not completely support these statements, but there is very definite evidence that I can show you that the quality of the program has been affected.

In Kentucky, 65 percent of all 9th grade pupils are enrolled in general-science courses; 88 percent of the high schools, serving 95 percent of the State pupils, offer this beginning science course; 93 percent of the enrolled pupils have an opportunity to take biology; and 77 percent of 10th grade pupils take it.

When you get to the junior and senior year, we find that 26 percent of our students are enrolled in advance courses in science, physics, chemistry.

All these figures compare favorably with the nationwide situation and do not alarm us unduly. What does disturb me, however, is the fact that 177 Kentucky science teachers have less than a minor in the subject they are teaching and cannot bring to their pupils the wide background and competence demanded by modern eduction.

If this were an isolated instance, it would perhaps be insignificant or would point toward a program designed to improve the teaching of science teachers.

Unfortunately, it can be repeated in almost every field. For example, 29 of the 131 foreign-language teachers we have in the State do not have a minor in the subject taught. But even more significant, 111 teachers of English have less than a minor, and there are 64 mathematics teachers with emergency certificates.

Mr. ELLIOTT. Let me interrupt you right there, Dr. Martin. What percentage is the 177 Kentucky science teachers of the whole number?

Mr. MARTIN. They did not give me those figures, but I think I can pretty well estimate that for you. We have less than 500 high schools in the State. The typical high school would have 1 or 2 science teachers at most. I would say that that is perhaps—177 perhaps of a total number of 500 or 600.

Mr. ELLIOTT. In other words, close to a third.

Mr. MARTIN. Yes.

Mr. ELLIOTT. Well, might you at some later time furnish us for the record the exact percentage, not only as to your science teachers, but as to your language techers and English teachers as well.

Mr. MARTIN. Mr. Chairman, we will be in a position to give you that information, because we are making a thorough study at present of all high school instruction, and this will be available in every field, because under our State board we have a citizen's committee that are studying the standards that we have, and also the curriculums that we have in our schools.

And this basic information, which is just now being compiled, will be available to you, and I will submit it at the earliest possible time.

Mr. ELLIOTT. The lady from Oregon.

Mrs. GREEN. You say you have 500 high schools.

Mr. MARTIN. Less than 500—some 473.

Mrs. GREEN. What is the range in size?

Mr. MARTIN. They will range in size from 45 to 1,000, 1,200.

Mrs. GREEN. How many high schools do you have that have less than a hundred enrollment?

Mr. MARTIN. We have only a comparatively few of those public high schools. We have perhaps some 30 or 35.

Mrs. GREEN. Well, one of your problems, then, as in many States, is reorganization of school districts, is it not, so that you could get a high school that could afford to pay teachers?

Mr. MARTIN. Our consolidation program—we do not have the reorganization problem in quite the same sense, since we are a large district State with only 216 school districts. It is a matter of reorganizing attendance areas. And by and large our counties are moving forward very, very rapidly with that.

In fact, only 8 or 10 counties that we have are not moving quite as rapidly as we would like to have them move in that field. We still have some small towns that hate to give up their high school. And those are generally the ones that have 75 to 100.

We are working toward the point where we can have 300 to 600 in our high schools, because of the type of program we want for them.

Mr. ELLIOTT. Does that mean in the top four grades—is that what you call a high school?

Mr. MARTIN. Yes, that is what I am talking about, the top four grades.

Mr. ELLIOTT. You would have from 300 to 600. That is considered an average size?

Mr. MARTIN. For our planning, that is an optimum size. We think that when you get to 300, that you have reached something like the situation in which you can give a broad program.

And after you go beyond 600, you do not gain generally by adding to the size of the school.

I have other information here. For instance, in our high schools we again have 193 librarians with substandard training. Of course, all this is pointing to the overall inadequacy of the school program rather pointing up just one aspect of it.

Mr. ELLIOTT. Dr. Martin, let me ask you a question right there, and I do this particularly because the gentleman from Kentucky, Mr. Perkins, and the gentleman from South Dakota, Mr. McGovern, and myself, and undoubtedly that would be true of the gentleman from Pennsylvania, had he been here at the time—but the three of us took a very great interest in passing, after a long period of effort, the Library Services Act of 1956. Was it 1956 or 1957?

Mr. PERKINS. Yes, 1956. We passed it in 1955.

Mr. ELLIOTT. One of the things now we are running into under that Rural Library Services Act, which is getting underway good in all the rural States and the rural sections of all the States—one of the principal difficulties that they are running into is the inability to find trained librarians.

Mr. MARTIN. Yes.

Mr. ELLIOTT. I gather from your testimony here that you are having the same trouble in your schools.

Mr. MARTIN. That is right.

Mr. ELLIOTT. Well, what is the solution to that problem now?

Mr. MARTIN. I suspect that we have to find some way of attracting to training in librarianship more prospective librarians. I just do not think they are being trained everywhere. I doubt if they are being trained much in other States. We are just not training enough

to do the job. And, of course, in your rural library situation, I think perhaps there the situation is—of course, they came in after we in the public schools had gotten almost everybody in sight, you know, that we could use, and then of course that put the burden greater on them to find other people to serve in that situation.

Mr. ELLIOTT. And of course this rural library services fits right in, in Alabama, and I am sure in your State, with the school system, in that these bookmobiles go to the rural schools and exchange books. And you have the same situation in Kentucky.

Mr. MARTIN. Yes. We have approximately 100 bookmobiles that cover the State. And if I may put in at this point, I hope that the Congress will make the full appropriation of $7½ million for support of that program. A cutback, as is anticipated, or as has been recommended, would kill our program almost before we got it started. The cutback, as I understand it, from $5 million down to $3 million—instead of cutting it back, it ought to go to the $7½ million as had been planned and anticipated at the time it was enacted. And that will undoubtedly help some in this problem you are faced with.

When you have more money available for librarians, there will be more incentive for girls to go into that field.

The second basic problem that I want to mention is, of course, this matter of inadequate classrooms.

In February 1957, I had the privilege of appearing before the subcommittee of this committee to testify in support of school construction legislation.

At that time I pointed out that we had a very difficult situation in Kentucky. We had only 122 buildings that under the school survey could be rated as satisfactory.

Since that time we have seen a whole lot of effort made to convince the Congress there was no shortage of classrooms and all that type of thing. Figures were twisted and misrepresented.

I think that we ought to point out here that on July 1, 1956, we had in Kentucky a shortage of 10,220 classrooms. And of that number, as I testified before, 7,620 were needed to replace rooms that were unsafe, unsanitary, completely inadequate, 1,600 were needed to house the overflow from crowded classrooms, and then a thousand were needed for increased enrollments.

During 1956–57 we had new construction and remodeling of spaces for 1,130, and now up to this time, in this school year, we have given approval to 1,023 new classrooms that it is assumed will be occupied this fall.

There will be a few additional spaces secured through remodeling. But this does not, of course, represent a gain of a thousand classrooms. It means, of course, that we were able to retire some that should never have been used, in the first place.

There is a fallacy in this, and the fallacy is that we are using our resources, but we are running out of money, and many of the school districts which have the least in the matter of resources, of course, have not been able, Congressman Perkins, to do anything about meeting their building needs.

I mentioned the foundation program and what it has meant. We had the day before yesterday $108,845,000 in outstanding bonds of our

school districts, revenue bonds of the school districts, at issue. And by and large, our school districts are at the maximum tax rate, or have voted special taxes for the construction of school buildings.

In Jefferson County we have a situation in which they have spent $20 million over the last 8 years for buildings, and yet you have in that county now 2 large high schools that are operating on double sessions.

If I may look at some of the proposals that you have before you, I would like to point out what I consider a serious deficiency in the program that the administration has presented.

To begin with, I consider it essentially a crash program. This problem that we are faced with is not the type, of thing that you are going to announce a crash program, a one-shot affair, and then solve it in any such manner.

And then again, I have serious doubt that you can improve education by singling out only one facet of it, such as science or mathematics, and give emphasis to that and to that alone, and get to the basic problem.

Mr. FRELINGHUYSEN. Mr. Chairman, may we interrupt the witness on this?

Mr. ELLIOTT. You may, surely.

Mr. FRELINGHUYSEN. Have you looked at the administration's proposals?

Mr. MARTIN. Yes, I have.

Mr. FRELINGHUYSEN. Why do you call it a one-shot program?

Mr. MARTIN. Well, I am thinking of it in the term of "crash" programs.

Mr. FRELINGHUYSEN. Why do you call it a crash program?

Mr. MARTIN. The President referred to it as a temporary program, the idea being that in a short period of time that this could be accomplished and over and done with.

Mr. FRELINGHUYSEN. Well, you have on objection to making it temporary if we can overcome the problems in a short time, have you?

Mr. MARTIN. I have not.

Mr. FRELINGHUYSEN. Well, then what is objectionable about that, and why does calling a program temporary mean it is a crash, one-shot program. It seems to me if it is going to fail it is because it is too comprehensive, and there will be members who feel strongly that perhaps the Federal Government has no responsibility to improve the teaching of foreign languages. Or there may be some that will disapprove of the scholarship program. Or there may be some that will suggest that we should not in any way subsidize teachers' salaries. Or there may be some objection to any of a number of parts of the program. It is really not just a one-shot program, but because it goes into new fields where we have done nothing so far, and perhaps doing it without full consideration of all the problems that may arise, such as the lack of effort on the part of communities and States, even such as yours, doing what they might well do. If they figure that the Federal Government is coming into help them out and avoid the necessity for doing something, they may well not do something.

Mr. MARTIN. I doubt if you and I are poles apart in our attitude, if I gather from your statement the attitude that you must get at the things that are basic to education.

Mr. FRELINGHUYSEN. Well, I really am questioning very seriously the validity of your argument that the administration program is a one-shot or a crash program—and perhaps I should let you continue—seriously inadequate to meet a lot of the major educational problems of this country.

That is a part from whether or not we should provide construction assistance. The administration has proposed construction assistance and has decided to shelve it because as a practical matter Congress has considered it, or at least the House has twice squarely and defeated it twice.

It is up to us if we feel we want to try a third time, I would say.

Mr. MARTIN. Well, I would agree with that. But since you have proposals which will provide the idea that I have, of going to the two basic problems, of doing something about salaries of teachers and providing the classrooms that are necessary, and my testimony is directed in that direction—then I believe that I am in order in making the observations which I have made here.

Mr. FRELINGHUYSEN. Well, we appreciate getting your testimony. But I do think that it is a difficult thing to dismiss out of hand as a crash program something that is as comprehensive as the proposals we are considering.

Mr. MCGOVERN. Would the gentleman yield a minute?

Mr. Frelinghuysen, I think one issue why you are taking issue with the witness is that you have not recognized the basis he has laid up to this time for the criticism that he is offering to these programs. He started out about two basic assumptions—that the two chief weaknesses in our present educational program are first of all inadequate teaching salaries, and secondly, the shortage of classrooms.

Now, this is the thesis he is operating on. And it is on that basis that he is taking exception to the administration's program which seems to be geared primarily to countering the challenge of the Soivet sputnik.

That is, it is a temporary effort to help us catch up primarily in the field of science and technical training, and does not meet the criteria that Dr. Martin laid down in the first part of his testimony.

Mr. FRELINGHUYSEN. Well, I have no objection to suggesting that we need a vastly increased program. But I do think that it is a unreasonable argument to say that this is a one-shot program. It certainly enters in in a number of ways to fields where the Federal Government has not taken any interest up until this point.

Mr. MARTIN. I will withdraw the term—if the term is what is the difference. But I do want to say that in my opinion the President's proposals do not go to the root of the problem. That they are in nature, as I pointed out earlier—there is a proposal to spend $145 million, whereas a year ago the proposal was some $541 million.

And from that sense, instead of an expansion of the ideas which I think the situation calls for, on the other hand we have greatly contracted, and we are dealing here with some things that are symptoms rather than going to the basic problem that faces American education.

Mr. FRELINGHUYSEN. Well, Dr. Martin, I do not really want to argue with you. You suggest that because the dollar amount that the President is now proposing to be spent on education is smaller than the dollar

amount which may or may not have been incorporated into legislation last year to provide assistance in the construction of schools, that that makes it inadequate.

On the other hand, dollars are not everything. In all these programs, as your testimony has emphasized, the reason the program was bigger last year is because the classrooms cost a lot more money than scholarships or assistance to teachers, or fellowships.

It is a vastly bigger program because to build a single school involves a lot of money.

We are vastly increasing the Federal responsibility if we should adopt these current recommendations, apart from the dollar amount, in ways which the President did not even consider, did not even mention, except to say we needed better teachers and more of them.

But he did not suggest there was any responsibility on the Federal Government to do anything about that.

Mr. MARTIN. The second objection that I have is the idea that we pick out science or mathematics and we say that it is important aside from the importance that we may go to other areas of instruction, whether it be English or history—that it is very, very bad if you neglect the foreign languages, but it is something that can be passed over if the teaching of English is neglected.

In the matter of scholarships, I think that the proposal there is an inadequate one since it calls for 10,000 annually, and that would be 10 percent of the high-school students in the upper 25 percent who graduate annually and do not attend college because of financial inability.

Mr. FRELINGHUYSEN. Well, how would you determine adequacies on a scholarship program, Dr. Martin?

Mr. MARTIN. It would be difficult, I am sure, to determine it. You certainly could not say we are going to give to the hundred thousand all a scholarship. But I doubt if you could say that when you had given a scholarship to 1 in 2 who would otherwise be denied a college education that you had an adequate program.

Mr. FRELINGHUYSEN. It would be more adequate than nothing. And you have to draw the line at somewhere less than everything. I just wonder how you would help us draw the line.

Mr. MARTIN. It would be difficult to say what the line should be. But I think I can look at the proposal and say that 1 to 10 does not, to me, appear to be adequate.

Mr. FRELINGHUYSEN. Well, where would you put it?

Mr. MARTIN. I would go much higher up the line than 10 percent.

Mr. FRELINGHUYSEN. You mean 9 out of 10?

Mr. MARTIN. No, I would not necessarily say that much.

Mr. FRELINGHUYSEN. 8 out of 10?

Mr. MARTIN. It just happens to be something, I think, that you have to consider the cost of it, and how far you are willing to go.

But I am assuming that if it is important that you train 10,000 of these better studentss who would otherwise not get a college education, and if that is important for the future of this country, that 20,000 of them would be far better, and would still be within the ability of the country to do that.

And now, in the matter of the providing for science laboratory equipment and minor remodeling, where there is no laboratory or no money to construct a laboratory, of course, that would not help science instruction.

The Hill-Elliott bill is much more adequate than the administration proposal in that its scholarship feature is more realistic and designed along the line of a more permanent program. Because, gentlemen, as I understand it, we might as well realize that this type of thing is going to be with us for a long, long time.

And any notion that we have, since education is a long time proposition, and education takes time—the fruits of what you do here or do not do will not been seen for 20 years.

If you do something about improving the science instruction in the high schools of this Nation, 20 years from now you will see the results of it, and not next year or the year after.

So the idea that you are launching on something there that is of a temporary nature, or that after you have done it for 2 or 3 years you can quit at that time does not seem to me to be a realistic notion.

Mr. ELLIOTT. Dr. Martin, I have had in mind, as far as I am personally concerned, as I have approached the problem, that our difficulty is to somehow or other lift up the thinking of America in regard to its educational system.

Now, the bill that I have proposed has 40,000 scholarships and 40,000 loans, among other things. And of course, as against 27,000 high schools, that is not very much.

I doubt if we can get any perceptible lift out of this program unless at least 1 scholarship per high school is available, and at least 1 loan per high school.

Would you think that would be a reasonable approach to this thing?

Mr. MARTIN. As long as the scholarship is always going over into the next county, or four towns away, it is not apt to have too much effect on the program there in the particular high school. I agree with you there.

Mr. FRELINGHUYSEN. Suppose there was no particular talent in an individual high school. Do you think you ought to have a Federal scholarship there?

Mr. MARTIN. Certainly there ought not be any recognition given where there is no talent.

Mr. FRELINGHUYSEN. Well, if we use your argument that there ought to be one in every high school, we might have some high schools with no talent.

Mr. MARTIN. In my opinion, in given years there might not be any particular talent. But over a string of years, there would be. I doubt if this thing of talent is concentrated. It might just as well appear in the small high school, assuming that through the stimulation of this program you have done something about the science instruction.

It might just as well come from that small high school as from a large high school. But certainly, to give recognition where there is no talent or no contribution to be made in this field, of course would be folly.

I do not believe, Mr. Chairman, that you ought to ever have it on the notion that every high school is going to have one, or every county is going to have some. But there ought to be enough to give them a chance to participate.

Mr. ELLIOTT. That is the problem that I have had in my mind—that we are going to have to bring this program, somehow or other, down

within the grasp, and certainly within the sight of all the graduates of American high schools, and particularly this group that is a very able group, so many of whom are not pursuing their education beyond the high school.

There has been a great deal said, Dr. Martin, about the number of scholarships available.

We have heard a great deal about there being many scholarships available, and this committee has done some surveying of available scholarships, and we find many unusual things about those that are available.

For instance, if you happen to have the name DeFroest you may be eligible for a $1,000 scholarship at Yale University. If you are a girl who does not smoke, you are eligible for a Harriet Rogers Jewett scholarship at Pembroke College, Providence, R. I.

Mr. THOMPSON. What can't you do?

Mr. ELLIOTT. If you are a girl who does not smoke.

Mr. THOMPSON. Oh.

Mr. ELLIOTT. If you are a cabdriver's son, the Daniel G. Arnstein scholarship pays full expenses for 4 years at any college, including travel, clothing, and spending money.

If you hanker to become a movie queen, there is a $1,000 Katherine Hepburn scholarship. An Eagle Scout has a special scholarship at Princeton. If, by chance, your father is a biscuitmaker in New York, you are eligible for a 4-year scholarship sponsored by the Biscuit and Cracker Workers Local No. 405.

At Harvard there is a scholarship for a student named Anderson, one for a student named Baxendale or Borden or Bright or Downer or Haven or Murphy or Pennoyer who lives—now, here is the catch—who happens to live in Iowa along the route of the Chicago Burlington & Quincy Railroad.

Now, a sizable percentage of the scholarships listed, when you analyze them, turn out in such a way as not to be of a great deal of service.

Mr. THOMPSON. You know, Mr. Chairman, rumor hath it that those taxicab driver scholarships are all at Harvard, too. Isn't that right, Mr. Frelinghuysen?

Mr. FRELINGHUYSEN. I do not know. I do not even know about Princeton, let alone Harvard.

Mr. MARTIN. I had occasion to meet with a group of parents in Paducah, Ky., sometime last fall, in October, I believe, and they discussed at that time scholarships, and it seems that the scholarships had all come to 2 or 3 members of the senior class, so that they sat around all summer long trying to decide which one the valedictorian would take and which one the second person would take. And when it ended up, they had chosen about two and the others went begging, because no one had qualified for them.

In other words, they had taken tests. They had won scholarships of that nature. And I think that there is a great deal to be said for that.

So many of the scholarships do have the type of thing that you have mentioned. Someone has a gimmick. You have to come back—sometimes the ones given to teachers—you have to agree to come back and teach in a particular school if you get the scholarship.

Mr. FRELINGHUYSEN. Mr. Chairman, on the subject of scholarships, I wonder, in view of the fact that Dr. Martin has suggested there should be no special Federal interest in the field of science and mathematics, how he feels about the desirability of channeling Federal scholarships to encourage the study of science and math, or do you think that, in itself, again is undesirable, that we should blind ourselves to the fact that there are certain areas getting less attention than others.

Mr. MARTIN. My earlier testimony indicated that, in my mind, certain areas were not getting less attention than others; that the problems of American education were pretty broad. That the neglect we have heard about in the field of science and mathematics generally extended across the entire curriculum and came about, generally, as a result of the poor training of teachers that we had. And then, of course, their unwillingness to stay where they were teaching in many sections of the Nation.

Mr. FRELINGHUYSEN. Well, you recognize, for instance, a lot of qualified science teachers do not stay in their profession—this is a general principle now—because there is more incentive to go out in private industry. And, since that is the case, do you think it would be undesirable for us to encourage getting more teachers to stay in their profession in those fields?

Mr. MARTIN. I think that would be an excellent idea.

Mr. FRELINGHUYSEN. Well, that is a concentration of effort in certain fields, though.

Mr. MARTIN. I would not make that concentration too narrow, because again—and maybe that was the basic disagreement we had a few moments ago—that this whole notion that you can pinpoint some things and say that these are the things that are wrong and that, if we can somehow solve these problems, we have solved all the problems that are important to education——

Mr. FRELINGHUYSEN. Don't you think perhaps there is more direct national interest in saying that we have an adequate number of math and science teachers, in view of the fact that this is a technological age, and that we are also in an age of peril in this race with the Soviets? Certainly, the Hill-Elliott bill, as well as the administration approaches, recognize that there are areas, such as engineering and mathematics and science, which require more attention than encouraging the study of English, as an example.

Mr. MARTIN. Over the long pull of the years, if you will improve American education, you will get from American education the scientists and the mathematicians that you need. Because our problem——

Mr. FRELINHUYSEN. Well, we have a pretty good educational system right now, and yet we still have different needs because of the pull away from the teaching profession.

Mr. PERKINS. Will the gentleman from New Jersey yield to me?

Mr. FRELINGHUYSEN. Yes.

Mr. PERKINS. Well, what Dr. Martin has been trying to discuss here is, until we do something about these basic educational problems, the shortage of classrooms, and provide our school systems with well-qualified teachers, these scholarships are going to be concentrated in certain areas—maybe in your area.

Mr. FRELINGHUYSEN. Well, I would have no objection to that, to tell you the truth.

Mr. PERKINS. And what suggestions does the gentleman from New Jersey care to offer the committee in the way that we may scatter these scholarships throughout the Nation?

Mr. FRELINGHUYSEN. Well, we have specific ways in which we could do it. We would allocate them on the basis of the school-age population, so Kentucky would get its fair share, purely on a numbers basis, not on whether the talent was there or not. It is conceivable that, if the schools are so poor in Kentucky, if they were in nationwide competition, they might not get anything.

I know nothing about the schools of the State of Kentucky. But I would hope we do not have to solve whether or not Kentucky can provide adequate teachers' salaries in order to do something about the present inadequacies of our present educational system nationally. If we do, I am quite sure we are not going to get any legislation at all.

Mr. PERKINS. Well, the only difference in our views—we have argued it out heretofore—I have argued for educational programs on the basis of need. And, to a certain extent, the gentleman from New Jersey has gone along with that theory here in the committee, and that is what Dr. Martin is talking about. It all gets back to that.

Mr. ELLIOTT. All right. Proceed, Dr. Martin.

Mr. MARTIN. I have a further statement to make.

Mr. MCGOVERN. Dr. Martin, could I interrupt here? I am sorry that I have an appointment at the radio studio, but I just want to express our own appreciation for your statement here today before I leave.

Mr. MARTIN. Thank you, sir. About the first time I realized that we are in what appears to be a serious recession in this Nation is the time I appeared before this committee on the 1st day of February. Up to that time there had not been too much talk. But since then we have seen, from day to day, and we have seen increasing concern about the type of recession that we now find ourselves in in this Nation.

I am advised there are more than 5 million people reported as unemployed. I was told yesterday by our department of economic security that there are 55,000 in the State of Kentucky who are drawing unemployment insurance, and perhaps there are that many more that, of course, are not drawing unemployment insurance, that are idle in the State of Kentucky. Now, of the ones who are drawing unemployment insurance, that means an increase of 9,000 in a 30-day period, in February over January.

I have also seen where there has been talk of building post offices and a great many things, and the chamber of commerce at home is very concerned about a new post office. And that, if there has been a time when the Congress could give attention as a measure, as an emergency measure, if you please, to give employment to American citizens, and at the same time provide much-needed facilities for housing the schoolchildren of this Nation, it seems that it is now.

And I strongly urge this committee to give attention to a school-construction bill, if not for the educational improvement of our boys and girls, if not for meeting the educational problem which exists in this Nation, then, as a practical matter, of meeting the business recession which seems to exist from one end of the Nation to the other at this time.

In closing, I would like to make one statement. As I said before, this whole notion apparently came about because we in America found ourselves one day not first in the matter of launching a satellite, but second, or rather, third in the launching of one, and we wondered how it came about. And the people looked about to see how it could have happened, and one group said this is what happened, and another group said that is what happened. And then, as is so often the case, the American public-school system became the scapegoat, and immediately everyone started saying, "There is something wrong with the American public-school system that caused us to fall behind in the flight into outer space, the launching of satellites, and the ushering in of the space age." And they started saying these things are inadequate—about American education. And they started saying the same things that we have been saying for 20 years, but no one paid any attention to us. But, suddenly, coming from the mouth of a scientist or a businessman or a politician, it becomes important.

Of course, I think by and large across this Nation the school people have accepted this as a great opportunity, because they had hoped, while people would still listen—and time is rapidly running out on it, because the big splurge that came as a result of the launching of the sputnik has already appeared to have spent itself when you go out in the local communities. They are no longer upset about it. They no longer discuss it.

We had hoped that while we had that opportunity, that we could point out these problems that we are faced with in education.

The proposals made by the President—certainly the proposals as enlarged in your bill, Mr. Chairman, would do much to improve and stimulate education. Any notion that it is going to improve or stimulate it so that tomorrow we are going to have a vastly different educational program than what we have today of course is a mistaken idea. And the product of that improved system we must wait 20 years for, because that, of course, is when those young men will come into production and make their mark in the world of science and engineering and all those fields.

Ending as I began, I sincerely and respectfully ask you, however, rather than looking at these symptoms, rather than attempting to solve the basic problem by just looking at a few fields, such as science and mathematics and ignoring the other fields, rather that you look at the basic problems of American education and do something about them.

We need scientists, we need mathematicians. But we need doctors, we need poets, we need preachers, we need all the people that go into the improvement of American life.

Thank you.

Mr. ELLIOTT. Well, now, Doctor, we have had some information, and I have read some things that indicate that there is not nearly as great a shortage of history teachers, for instance, as there is of physics teachers. There is not as great a shortage of government teachers, perhaps, as there is of modern foreign language teachers.

I don't know how valid the figures are that I have seen in that connection. I don't have any way of checking them. But I have the general feeling, based upon my observation, that we have a pretty serious shortage now of scientists, and that actually, instead of getting

ourselves out of balance by giving scientific training a priority now, what we will be doing is bringing more into balance the supply of scientists as against the other fields.

I realize that is a controversial subject, but I did want to give you the benefit of the little observation that I have had.

I think the imbalance today is in favor of scientists based upon the information I have been able to get.

Mr. MARTIN. I doubt, however, Mr. Chairman, if that imbalance is as great as it has been pictured. And I think that when you begin to—if you are thinking about giving to the teacher, one group of teachers, a salary supplement that is going to be denied to the others, there are psychological problems involved there that are of very great moment to education.

Mr. ELLIOTT. Well, I agree with you insofar as teachers' salaries are concerned. But I am thinking of this thing. You say in Kentucky one-third of your science teachers have had less than a minor in college sciences. I doubt if you would find that with your history teachers, your English teachers. Maybe you quoted us figures. But there are certainly subjects within your school system where you won't find one-third of your teachers having less than a minor in college in the subject they are attempting to teach.

Mr. MARTIN. As soon as we have that information, I will provide you with it.

Mrs. GREEN. I have one question. When you speak of imbalance, do you think that if the schools paid a salary that would compete with private industry that we might suddenly find we have as many science teachers as we have history teachers?

Mr. MARTIN. I suspect that you would. But I am also concerned about what you would do to that history teacher when you immediately say that it is important that we have teachers here, and we are going to pay you enough to get you.

Mrs. GREEN. You misunderstand. I would oppose—I don't think you pay teachers more because they are in a field. But I say raise the level of all of them. If we paid salaries that would compete with private industry. And you spoke very well, I thought, a few minutes ago—I heard the first of your testimony and then the last and missed the middle part—but you spoke of the fact that we could not solve the problems in the next 3 or 4 years, which I think is overlooked pretty much right now in the hysteria we have had over sputnik.

But I have had the feeling that we have a great many scientists and engineers that might be better utilized than at the present time. I don't know whether hoarding is the right word, but I have had different people in industry tell me that they keep a certain percentage above what they need, so that in case of an emergency they will have them there. They don't want to let them go.

Do you have any information on that?

Mr. MARTIN. No; I do not have.

Mr. ELLIOTT. The gentleman from Kentucky.

Mr. PERKINS. I have no questions, Mr. Chairman, except I am very much in accord with Dr. Martin's testimony. I feel that he is one of the outstanding educators of the whole country. I know he is doing an excellent job in Kentucky, and he believes that we should attack the basic problems first. And I am thoroughly in agreement with his views along that line.

I know that this committee is going to have much difficulty in trying to work out a bill, but if we fail to bring out a school-construction bill—unless we get more support than we now have, we will not bing out any school-construction bill.

Of course, I feel, Dr. Martin, that the committee will approach this scholarship program from a general viewpoint, as you have presented it to the committee. And if the area is narrowed down to science alone, perhaps it will bring about some stimulation in that particular field.

I feel that your viewpoint has been excellently presented, and I am hopeful that the committee will go along with your recommendations.

Mr. ELLIOTT. Thank you very much, Dr. Martin.

Mr. MARTIN. Thank you, Mr. Chairman.

Mr. ELLIOTT. The lady from Oregon.

Mrs. GREEN. I do have one other question. If you have any answer to it, I would like to know. Two things have bothered me in the teaching field. One, that we do not identify the career teacher at an early time, the person that really intends to stay in the teaching business and make it a profession and award that teacher to the point where they will stay. Do you have any——

Mr. MARTIN. I am afraid I do not have.

Mrs. GREEN. Do you support across-the-board increases for all teachers regardless of their ability?

Mr. MARTIN. I certainly would favor a payment to teachers on the basis of merit if someone in his wisdom was able to devise a scheme whereby you could determine the merit of teachers. Certainly we do that in our own State within districts, that they have the right to do that. And to some extent they do that. However, I am afraid that the extra increments sometimes are not given on the basis of merit, but they are given on the basis of, well, popular demand for special types of services.

Mrs. GREEN. Or, I might add, sex?

Mr. MARTIN. Perhaps sex, on occasion. And with some justification on the basis of sex if the father happens to be the head of a family, because of the additional responsibility that he may have, because we have not done enough of that. We have driven from the profession most of the married men because they cannot afford to support a family at the salary paid teachers. And that has been a detriment to education.

Mrs. GREEN. Are you saying that you would pay men more than women—a teacher of the same ability and background and doing the same job?

Mr. MARTIN. I am not saying that at all. I am not saying that. On the other hand, I am not saying that we must forever give to every teacher the same type of salary increment. I am just recognizing a problem. Just as we have not found a way to pay for merit for the excellent teacher, we have not found a way yet to keep the science teacher or the man in the profession and all of education has been hurt by it.

I don't have the answers.

Mrs. GREEN. Do you think the answer is, as we do it in other parts of our economy, to raise all salaries for the women and the men?

Mr. MARTIN. That may be the answer. We never have tried that answer yet. Maybe that would solve it.

Mrs. GREEN. I feel called upon to defend my sex in that. The other question I have is that in the teaching business—and I think this drives out both men and women—there is no way to be promoted except to leave the classroom and go into the supervisory field or the administration field.

Can't the teaching profession, the education field itself, solve this? As I have pointed out before, the doctor, the surgeon who is particularly skilled is the one who performs the operation, is close to the patient. He doesn't go out away from the patient. And this is true in the legal profession. But in education and social work, as soon as the person has proven his ability, then we promote them and take them out of the classroom, away from the youngsters, who desperately need this qualified and capable teacher, and put them in an office.

Mr. MARTIN. I suspect that that problem is concerned with the problem of who is the employer. The doctor becomes a surgeon because of the nature of who rewards him for his services. He specializes where he is. Because we teachers work for the public, other considerations get into it.

That makes it much more difficult to be solved than it is to be solved in the case of an individual attorney or an individual doctor.

Mr. FRELINGHUYSEN. Before Dr. Martin leaves, I just want to say I think all the members of the committee have been extremely interested in your testimony and grateful to you for coming here to discuss the problems with us.

I am somewhat puzzled by your final references to the effect and meaning of the Soviet satellite. You suggested that people generally were already relaxing, that the hysteria, as Mr. Perkins called it, was subsiding, and back home there was not much interest. Of course, that is the excuse that a lot of my conservative friends are using to say that the Federal Government does not need to inject itself into a lot of Federal programs to improve the educational system of the country. So in a sense you are taking a strongly conservative position if you say the satellite has not deservedly caused us to take a look at what the Federal responsibility is.

And I gathered you certainly are not going so far as to say there is not a Federal responsibility as a result of the launching of the satellite.

Mr. MARTIN. I think the Federal responsibility has been there all the while. I do not think it came about as the result of the satellite. I don't think it ought to be solved only in reference to the satellite, because to do so will be a temporary program. It will be a program that will not go to the basic solution. Maybe not a temporary program, but will be at least thought of originally in terms of it being a temporary program. I don't believe we are going to solve it that way.

Certainly the space age, the ushering in of the space age, has changed a great many things.

Mr. FRELINGHUYSEN. Yes, but what worries me—and again maybe I am speaking too strongly as a Republican and I may antagonize you by doing it. You don't think Washington is going to solve all these problems unless there is at least as much effort or perhaps a

good deal more effort at the local and State levels. You have come here today and said in effect—as I understand your main arguments there are nowhere enough teachers or classrooms in the State "Because we are too poor to provide them, and therefore we need your help." But if we do put first things first, it seems to me we have to have a revival of interest at the local and State level and see that more of the resources in the State, the citizens' wealth, is put to use in the State, and not turned to us and say "We have to borrow from other States to solve our problems."

Again, I don't know enough about the financial conditions in Kentucky, but I would hope you are able to do more and there has been some change in the people back home with respect to the curriculum, with respect to the necessity for increasing teachers' salaries, and the willingness to sacrifice in order to increase them, and perhaps the necessity for improving the classroom facilities.

In a sense, the facilities can be inadequate and you can still produce well-educated children. I mean you can argue that that is less important than adequate teachers. If you can stimulate the child with adequate teachers, you may not need superior classrooms.

But I would hope that you are not looking entirely to Washington to solve your problem. Because I think no matter how ardently we might want as broad a program as you suggest, that we are not likely to get it unless there is some real cooperation and real effort made at the local and State levels.

Mr. MARTIN. I would like to say this: If I left the impression that we were not doing anything or were not attempting to do anything, then I left a false impression.

Mr. FRELINGHUYSEN. I am sure that is not what you meant to say.

Mr. MARTIN. We believe that during the last 2 years we have made as much or more progress than we have made in education in any comparable period in our history in Kentucky.

In September, before sputnik, the State board of education, meeting with me, decided that we wanted to take a look at the standards for our high schools, and also to look very carefully at the program of studies from grades 1 through 12. And they authorized the appointment of committees. And we have committees of distinguished lay and professional citizens in Kentucky who are giving attention to that. So we certainly are going ahead.

We have in Kentucky, during the last 2 years, built more classrooms, perhaps, than we built in any 10 years over the period. And our school districts have responded by additional tax levies and that type of thing. But as you have seen across the country, as the economy has tightened there is more and more reluctance on the part of local citizens to vote the additional taxes that are needed.

Basically, you also have the problem of the unequal distribution of wealth and children in this Nation, and we just might as well face it.

There is also the situation—and I am not going into that to any great extent—two of the chief products of Kentucky are tobacco and whisky, and the Federal Government has preempted taxation in those fields in a large measure. Whisky is taxed $10.50 a gallon by the Congress, and of course if we had 50 cents of that $10.50 to apply toward the improvement of our educational program, the amount of

improvement would be a tremendous thing. It would be some $25 million or $30 million more than we could do.

But those are some of the problems that are involved.

Understand, I know that the taxpayer in Kentucky does not pay the tax. But by preempting the tax source in those fields, you make it more difficult for us to finance our own institutions. And that, of course, is the situation also in tobacco.

Those are some of the problems we are faced with. And as long as we have this great disparity of wealth that we have in this Nation, and as long as this Nation depends to the extent that it does upon enlightened citizenry in this Nation, then I think the Federal Government has a responsibility, even though they are very belatedly accepting it here, and of course only under the great drive of sputnik.

I never hear sputnik mentioned by the citizens generally again. I mean the first flush is gone.

Mr. FRELINGHUYSEN. My only point was that the launching of sputnik is not going to cause Kentucky to relax and say the Federal Government is going to take care of it. If that is the case I am sure that is not what you implied or said.

Mr. MARTIN. I have not implied that.

Mr. FRELINGHUYSEN. The citizens of the so-called wealthier States are hard pressed by continuing demands for additional expenditures and we are sure we will run into trouble right away. I hope you will agree with them that it will only be successful if you continue to make at least as much effort and probably more effort at all levels because of the various problems affecting the country as a whole.

Mr. MARTIN. I believe that we must make substantially greater efforts at every level for the solution of the problem.

Mr. FRELINGHUYSEN. Thank you very much.

Mr. ELLIOTT. Thank you very much, Dr. Martin.

Mr. MARTIN. Thank you.

Mr. ELLIOTT. Our next witness this afternoon is Mr. J. Marvin Dodson of the Kentucky Education Association.

You may proceed in any manner you desire.

STATEMENT OF J. MARVIN DODSON, EXECUTIVE SECRETARY, KENTUCKY EDUCATION ASSOCIATION, LOUISVILLE, KY.

Mr. DODSON. Thank you, Mr. Chairman, and members of the committee.

Dr. MARTIN, through the questions that have been asked, has already brought out some points that I had planned bringing out. So with your permission, rather than go through this in detail, I have 3 or 4 points I would like to bring out and then if you have any questions about any of it later, I will be glad to answer them.

Mr. ELLIOTT. Before you begin, will you give us a little of your background?

Mr. DODSON. Yes. I am at present executive secretary of the Kentucky Education Association which is an association of about 24,000 schoolteachers in our State.

I have been a classroom teacher. I have been a high school principal, a county superintendent, a city superintendent. I was in the Department of Education, before going with the Kentucky Education Association.

I have been with KEA about 8 years.

I would like to take a few minutes to discuss, even though it has been dealt on pretty much at length, the teacher situation in our State.

It seems to me to be important, if we are going to improve the schools in our country that we give some thought, at least, to the quality of the instruction that goes on in the classroom.

In Kentucky we have approximately 24,000 teachers. Of this number about 3,000 are teaching on what we call permits and that was brought out here a while ago as to what a permit is. Many of the teachers who are teaching on the permits have only 6 or 8 or 10 college hours. I do not mean to be critical of these teachers. They are doing the very best they can. And some of them are doing a right good job.

But we are losing some of the best-qualified teachers in our State, also; many of them go into industry or business and some go into other States where the salaries, of course, are better.

Approximately, 1,800 teachers leave the profession annually on a permanent basis. We know this because they withdraw their retirement funds and quit.

Approximately 1,000 additional teachers are needed each year to take care of increased enrollments.

Now if we could fill the 1,000 new positions, each year, with certified teachers and could replace the 1,800 who leave permanently each year, and then replace the 3,000 who are now teaching on a permit, we would need 5,800 additional teachers out of the 24,000. And this still does not take into account those who quit for 1 year and then come back a year or two later.

There are about 1,000 others who come in 1 year and go on the next. And of course, who have not withdrawn their funds from the teachers' retirement system.

The teacher situation in Kentucky is unstable. The turnover is terrific. The average salary paid members of the instructional staff, that is, teachers, principals, and supervisors, all totaled up, and average, is about $3,225.

It is obvious that a male teacher with a family can hardly eke out an existence on a salary no greater than this.

Most of our men who teach find other employment to supplement their teaching salaries. However, many of them finally get discouraged and go into industry where the remuneration is much more lucrative. Even our best and most qualified teachers cannot do the job they could do if it were not necessary for them to do other things in addition to teaching school. The quality of instruction that goes on in the schoolroom suffers as a result of this.

All of us are hearing—it has been brought out in this hearing of course, and reading a lot about the system of education in the Soviet Union, but I hope, as Dr. Martin has indicated, that we do not let the scare over the apparent advances which the Russians have made in education cause us to place more emphasis on one phase of our educational program to the extent that other phases of it suffer of are neglected.

A good scientist and a good mathematician must have a good educational background all the way through school. We now know that

science, for instance, can be taught effectively in the elementary grades.

Our schools do have a deep responsibility in the field of science, but they, also, have a sacred duty to discover and develop the talents of every child, rich or poor, with high or low abilities. They have the miraculous task of developing into American citizens the children of more than 100 nationality backgrounds.

To do this they must nurture our culture, the arts, the liberal arts, the language, and the deep significance of our history.

To maintain our very life we need the most able people we can secure to be sure in science and mathematics, but we, also, need them in government, and in education and in medicine, industry, and so on. We do not force people into careers, but allow them to choose where they can best serve humanity. Therefore, it is highly essential that our schools be strengthened in all phases of the education program in order that all youth may become aware of its maximum strength and potentialities.

As a concluding paragraph I would like to say it is my hope that the Congress will give due consideration to the improving of the teacher salaries, of those who are responsible for the quality of instruction, that goes on in the classroom.

It is my further hope, as has already been said by Dr. Martin, that we do something in the way of school building construction. In our State many school buildings are outmoded, unsafe, and overcrowded. These conditions are disillusioning to the pupil and discouraging to the teacher.

Mr. Chairman, very briefly that is my statement. I desire to answer or attempt to answer any questions that anyone might have.

(Mr. Dodson's prepared statement is as follows:)

STATEMENT OF MARVIN DODSON, LOUISVILLE, KY.

I am J. Marvin Dodson, executive secretary, Kentucky Education Association, Louisville, Ky.

I would like to take a few minutes to discuss the teacher situation in our State. It seems to me to be important, if we are going to improve the schools in our country, to give some thought to the quality of instruction that goes on in the classroom, not only in the secondary schools but in the elementary schools. A high-school pupil has no chance of developing to his maximum potential if his background and experience in the elementary grades have been poor and limited. In our State, many boys and girls with ability become discouraged and drop out of school before reaching high school. Of course, a number of factors enter into this. However, the improvement of the actual teaching that goes on in the classroom will reduce materially the number of dropouts in the elementary grades.

Schools are operated for one purpose only—that of educating our youth. Only when we begin to attract the most capable young men and women into our classrooms will the boys and girls of America get the educational opportunities that are justly their due.

In Kentucky, we have approximately 24,000 teachers. Of this number, about 3,000 are teaching on what we call permits. A permit is a license to teach school granted to an individual by the State board of education, but to person who is not qualified to meet the requirements for a regular and valid certificate. Many of the teachers who are teaching on a permit have only 6, 8, or 10 hours of college. To be sure, no criticism is meant of the teachers who are teaching on permits. Many of them have done good jobs or at least the best they could under very adverse conditions.

We are losing some of the best qualified teachers in our State. Many of them go into industry or business and some go to other States where the salaries are

better. Approximately 1,800 teachers leave the profession annually on a permanent basis. We know this because they withdraw their retirement funds and quit. Approximately 1,000 additional teachers are needed each year to take care of increased enrollments. If we could fill the 1,000 new positions each year with certified teachers, and could replace the 1,800 who leave permanently each year, and replace the 3,000 who are teaching on a permit, we would need 5,800 additional teachers. This still does not take into account those who quit for 1 year and come back the next year. There are about 1,000 others who come in one year and go out the next who have not withdrawn their funds from the teachers' retirement system.

The teacher situation in Kentucky is unstable. The turnover is terrific. The average salary paid members of the instructional staff—that is teachers, principals, and supervisors—in Kentucky's public schools in 1957–58 is $3,225. It is obvious that a male teacher with a family can hardly eke out an existence on a salary no greater than this. Most of our men who teach find other employment to supplement their teaching salaries. However, many of them finally get discouraged and go into industry where the remuneration is much more lucrative. Even our best and most qualified teachers cannot do the job they could do if it were not necessary for them to do other things in addition to teaching school. The quality of instruction that goes on in the classroom suffers as a result of this.

All of us are hearing and reading a lot about the system of education in the Soviet Union today. One is constantly hearing comparisons made of our own educational system with that of Russia. I am sure that the system of education in Russia is serving its purposes well, but we are not educating our young people for the same kind of life the Russians lead.

I hope that we do not let the scare over the apparent advances which the Russians have made in education cause us to place more emphasis on one phase of our educational program to the extent that other phases are neglected. A good scientist and a good mathematician must have a good educational background all the way through school. We know how that science, for instance, can be taught effectively in the elementary grades. I would like to offer a plea that very strong consideration be given to strengthening the educational program from grades 1 through 12, not only in science and math but in the other subjects as well. Our schools do have a deep responsibility in the field of science, but they also have a sacred duty to discover and develop the talents of every child, rich or poor, with high or low abilities. They have the miraculous task of developing into American citizens the children of more than 100 nationality backgrounds. To do this they must always nuture our culture, the arts, the liberal arts, the languages, and the deep significance of our history.

To maintain our very life we need the most able people we can secure in science and mathematics, to be sure, but we also need them in government, the perpetuation of moral and spiritual values, in education, medicine, industry, business, agriculture, transportation, in art and culture, and in all walks of life. As opposed to Russia, we have a deep respect for the individual and the personality of man. We do not force people into careers but allow them to choose where they can best serve humanity. Therefore, it is highly essential that our schools be strengthened in all phases of the educational program in order that all youth may become aware of its maximum strength and potentialities.

It is my hope that the Congress will give due consideration to improving the remuneration of those who are responsible for the quality of instruction that goes on in the classroom. It is my further hope that something will be done in the way of school building construction. In our State, many school buildings are outmoded, unsafe, and overcrowded. These conditions are disillusioning to the pupil and discouraging to the teacher.

Mr. ELLIOTT. As you made your statement, I was thinking about the fact that there is pending now before this committee—not before this subcommittee, but before the general Committee on Education and Labor—bills such as the administration bill.

Mr. DODSON. That is right.

Mr. ELLIOTT. And the bill which I introduced and which the gentleman from Kentucky, Mr. Perkins, introduced, and I think, perhaps, some other members of this subcommittee, dealing with scholarships and loans and equipment and that approach to education, and then

there are pending before the general committee bills designed to provide aid to the States, grants to the States for school construction. And there is another classification of bills that is designed to provide aid to the States for schoolteachers' salaries, and in combination with grants for schoolchildren.

I believe I might say to the gentleman from Kentucky here that you are the sponsor of all three classifications of those bills, are you not, Mr. Perkins? I think I noticed you introduced a few days ago bills for all three purposes? If a choice had to be made, I take it, that you would favor those bills providing for school construction, or would include teachers' salaries—would that be your first?

Mr. DODSON. That would be my first thought—bills that would provide for improvement in some way or other of teachers' salaries plus school construction.

Mr. ELLIOTT. But you do feel, or did I gather from your statement that you do feel that the field that this subcommittee is operating in is a legitimate and needed operation at the present time?

Mr. DODSON. Yes.

Mr. ELLIOTT. You favor the scholarship idea and the stimulation of scholarships and even, would say, to the extent of giving some priority to the sciences?

Mr. DODSON. Well, of course, my first choice would be, as I mentioned a minute ago, the school construction, and doing something for all of the teachers in the United States.

As a practical matter that may not be possible. I do not know, of course, I think the scholarship program, if that is the next best thing we can do, is, certainly, better than nothing?

Mr. FRELINGHUYSEN. If you have to choose between more adequate teachers or more adequate rooms, which would you choose?

Mr. DODSON. I would take more teachers.

Mr. FRELINGHUYSEN. If you had to choose between the two?

Mr. DODSON. More adequate teacher salaries or added schoolrooms?

Mr. FRELINGHUYSEN. Yes.

Mr. DODSON. Well, that would be a hard decision to make.

Mr. FRELINGHUYSEN. We have a lot of hard decisions to make.

Mr. DODSON. I am sure of that. In our State we are short on classrooms, to be sure. We need classrooms. You, certainly, cannot do much in the way of an adequate program without enough classrooms to have a pupil-teacher ratio that is at least reasonable.

Mr. FRELINGHUYSEN. You cannot do much without good teachers.

Mr. DODSON. I agree it would be a hard decision to make. Sometimes, however, we have been, as you know, favoring school construction measures because we thought that was the best and most practical thing at the time to do.

Mr. FRELINGHUYSEN. For the Federal Government to do, it is the easiest way in which the Federal Government could help.

Mr. DODSON. Right, that is right. In other words, over a period of years we have felt that probably that would be the least controversial at the Federal level.

Mr. FRELINGHUYSEN. Still we tried to get a bill through—I always thought so, too, until we think to get it through.

Mr. DODSON. Yes.

Mr. FRELINGHUYSEN. I didn't mean to interrupt. You suggested in your testimony that the quality of instruction is of great importance.

Mr. DODSON. Yes.

Mr. FRELINGHUYSEN. I am wondering how does the Federal Government concern itself with the quality, or do you put that at the local or State responsibility level?

Mr. DODSON. I think it is the responsibility of maybe all three. The Federal Government once it recognizes that there is a need for the improvement of teacher salaries will in the end improve the quality of instruction that goes on in the classroom, because when you have, as we have today, teaching school, right at this very hour in Kentucky, 3,000 teachers who are just barely out of high school, in a little 1-room school that is overcrowded, the quality of instruction cannot be much. The teacher may be just as conscientious and sincere, and the probabilities are that she is.

Mr. FRELINGHUYSEN. You mean to try to force us to accept the general principle of subsidizing all teachers' salaries? If we could hook it up to the national interest that it requires more physics and more math and more science teachers, because of the fix we are in, because it is a technological age, and in order to keep up in this contest with the Soviet Union, we must have something there. I am sure in your own State you have more serious problems teaching science and math? I would assume that your State would have the same experience as we are having nationwide. And if we could somehow develop on that base, I think we would have a more practical program, and the same thing applies to the possibility of the Federal Government encouraging on the part of our young people the opportunity of a scientific career and by that token, with good teachers and developing an appreciation of the value and the interest of that type of career, do a lot more than is presently being done. It isn't in derogation of what is being done in the history or English departments that the Federal Government is expressing an interest by scholarships or by letting the teachers go to summer schools to improve their educational field. I do not think you have to say that it is an all proposition. I would hope that both the administration bill and Mr. Elliott's bill recognize that there is a more serious problem in some areas than there is in others and that the Federal Government might go into those areas rather than across the board. The more you say, "I want my teachers' salaries increased and more school construction," the more likely you are to get nothing, I am afraid.

Mr. DODSON. That may be true.

Mr. PERKINS. Suppose we just stopped and subsidized teachers' salaries in the field of science and go no further. The question then remains what are we doing to education in general? What would happen there?

Mr. DODSON. Well, that is the point I started to make. I think all of us are aware there is a need, and an immediate need maybe in some areas we have been talking about, but I do not hope we will go overboard and stress those to the extent that we let all of the other phases that we have in our student program which we thought all through the years important, such as the result of our immediate interest in something that is right before us.

Mr. FRELINGHUYSEN. If the Federal Government takes an area in some area, the local citizens will not say that the others are not important. It may deemphasize some. I do not know that the country would be the loser in that.

Mr. DODSON. A youngster to take advantage of a scholarship must have a good background, don't you think, in more than just he should have——

Mr. FRELINGHUYSEN. Of course, no one is arguing you have to have an either all—that you do not need to know which is a noun and which is a verb of course, you have to know the groundwork. You have to have the groundwork in a lot of things. To be a well-educated citizen, and a scientist needs a rounded education. I am not arguing against the rounded education.

Mr. DODSON. Yes.

Mr. ELLIOTT. The gentleman from Kentucky, Mr. Perkins.

Mr. PERKINS. I think you have well presented the problem. And I have observed all through my life, ever since I was a rural schoolteacher back in 1931 and 1932 and 1933, that the quality of teachers, especially, is perhaps our biggest problem. It is a job for everybody. I do not know whether we need to improve the curriculum. That is, undoubtedly, true. But somebody has got to do something about the quality of instruction. And we have got to do more about it than we are doing at the present time. That is the thing that rolls around in my mind all of the time.

Mr. FRELINGHUYSEN. The only question is: Who is "we"? If we are spending 16—and maybe we are spending $30 billion in education, to what extent is "we" the Federal Government? I am not sure that it is not, perhaps, some of the States should be doing more. It is only $3,200 a year for the average. There must be enough wealth to do more, if they wanted to.

Mr. PERKINS. The gentleman from New Jersey very well knows my views. He and I have discussed this problem at length. But it is the duty of the Federal Government to assist in a problem of this kind; to give some assistance where the national welfare of our citizens is concerned, and especially, to bring about some equality in education opportunities. Kentucky is spending more of its per capita income today than the State of New Jersey. Our efforts are greater, despite sputnik.

Perhaps we can make a greater effort. And I will agree with you on that, but here we have the problem, and, in the meantime, the generation is just eroding away and not getting the benefit of the type of teaching necessary, and facilities in the schoolroom that these should have.

I reiterate again that it is our duty to enter the field and not to provide curriculum or let the qualifications interfere with the States in the school systems, but to provide some money that will pay those teachers, give those teachers a salary that will be attractive and that will cause those teachers to remain on the job. That is the basic problem at the roots.

Mr. FRELINGHUYSEN. Let us hypothesize—let us grant that we agree, in order to get adequate teaching in Kentucky, you have to

double the salary, and the Federal Government must do it.

Mr. PERKINS. Not alone; no.

Mr. FRELINGHUYSEN. That is one of the things. That will encourage a lot of able people who presently do not stay in or do not seem to consider it, and that the money can only come from the Federal Government. Let us assume that, I say. If we should do that, do you not think it is almost inevitable that we are going to be a lot more interested in the quality of the Kentucky teachers than we would be if we do not provide any of this? It is all right to say, "Let us keep the Federal Government out of what the curriculum is," and how we determine whether the teachers are qualified or not. We are putting up 50 percent of the money, and it will have to be a more direct responsibility to see that you are doing a reasonable job with my taxpayers' money than I would if I was not providing a thing. That, I think, is the crux of it. How vigorously you go in, and on what basis, to solve those problems.

As you say, I am participation by the Federal Government. I would be inclined to be somewhat less vigorous, perhaps, than the gentleman from Kentucky.

Mr. PERKINS. You and I both are against Federal control. We have Federal cotnrol where they have been operating 50 years.

Mr. FRELINGHUYSEN. We have never put up a program where we put up half of the money for teachers' salaries.

Mr. PERKINS. We have had programs where the Federal Government has been in the public-school system. So, we are not going to get anywhere discussing that.

Mr. ELLIOTT. I want, before we close, to commend both of these gentlemen for their great interest in the school system of America. I have had the privilege of working with them through the years on this committee. And I will say to Mr. Dodson what I am sure he already knows; that the gentleman from Kentucky, Mr. Perkins, that today there is no one more interested in matters of school education.

Mr. DODSON. We are aware of that.

Mr. ELLIOTT. At the same time, the gentleman from New Jersey has been most interested in educational legislation before this committee in the years he has been here.

Mr. PERKINS. Wholeheartedly supported such a bill last year.

Mr. FRELINGHUYSEN. Might even do it again.

Mr. ELLIOTT. And I want to thank Dr. Dodson, and Dr. Robert Martin, for the very fine, thought-provoking testimony they have brought us.

Mr. DODSON. I appreciate the opportunity to be here.

Mr. ELLIOTT. Our next witness this afternoon is Mr. Charles Dewey, president of the Washington Hospital Center, a former Member of Congress from the State of Illinois. We are happy to have you here, Mr. Dewey, and I note we have a statement from you. We will be happy to hear you. You may proceed in any manner that you desire.

STATEMENT OF CHARLES S. DEWEY, PRESIDENT, BOARD OF TRUSTEES, WASHINGTON HOSPITAL CENTER, ACCOMPANIED BY KATHERINE KNAUFF, DIRECTOR OF NURSING SERVICE, WASHINGTON HOSPITAL CENTER

Mr. DEWEY. Thank you, Mr. Chairman and gentlemen. I will be as brief as possible and in order to hold the remarks to the minimum, I have printed them and shall now read them. [Reading:]

My name is Charles S. Dewey. I am presently president of the board of trustees of the Washington Hospital Center, which operates a school of nursing.

The purpose of my appearance is to request that accredited schools of nursing, operated by hospitals, be covered under H. R. 10381, Title IV: Work Study Program, as institutions of higher education. (The school accreditation is given by the National Nursing Accrediting Service.)

I base my request upon the following points:

(*a*) Of the total of 1,125 nursing schools, only 274 schools, at the present time, are fully accredited by the National Nursing Accrediting Service. These 274 schools have an enrollment of 44,673 students.

(*b*) To be accepted as a student nurse, the applicant must have been graduated from high school and have had 2 years' study in the sciences and 2 years' study in mathematics.

The declared purpose of H. R. 10381 is to strengthen the national defense through programs designed to stimulate development of and increase the number of students in science, etc. At the present time there is an estimated shortage of 50,000 trained nurses in the United States and it is expected that, with growth of population and advancement in medical science, this shortage will increase to 170,000 by 1970.

The full course to become eligible to take the States' licensing examinations, requires 3 years. After that period, nurses are designated as graduate, registered nurses. In many cases, the instructors for schools of nursing are graduates of hospital-supported schools who have furthered their education. Those not completing the full 3 year course may find employment in hospitals or amid the general public as "practical nurses" and "nurses' aides."

The expense of educating a nurse in a hospital-supported school of nursing is borne by the sick, a portion of the hospital bill covering this expense; the expense bears heavily upon the hospital having a school of nursing, and for this reason many such schools have been closed.

The average cost of educating a nurse is $1,080 per year (by the figures of the Washington Hospital Center of which I am president), or about $3,240 for the full course. The student nurse pays a tuition fee of about $135 a year and follows a work-study program in the Washington Hospital Center in caring for the sick as her experience justifies. This pattern is typical of all schools of nursing supported by hospitals. In lieu of salary for her services, she is provided, free of cost, lodging, food, uniforms, laundry service, recreation facilities, and often affiliation with a college for supplementary course, for which she receives college credits.

There are, as far as I know, no schools of nursing maintained by the Federal Government. As to the Garfield Memorial Hospital School of Nursing, which was established in 1889 and has been consolidated with the Washington Hospital Center, a recent questionnaire developed that 16.6 percent of our graduates are in Government service. In other words, the sick people in the hospital help pay for nursing education as part of their hospital bills and then almost one-fifth are then employed by Government departments.

Title IV of H. R. 10381 provides for a work-study program to institutions of higher education which carry out work-study programs according to the requirements of the Commissioner.

(*a*) My contention is that an accredited school of nursing operated by a hospital, due to the scholastic requirements, is an institution of higher education.

(*b*) The students follow a work-study program in connection with nursing education coordinated with the operations of the hospital.

(*c*) The nature of the employment is to gain practical experience in line with their studies. One learns by doing.

(*d*) The entrance examination for a student nurse emphasizes an aptitude for a special interest in the science and technique of the care of the sick.

(e) In lieu of a straight salary or payment for services, the student nurse received free of charge while a student—

1. Room and board, light and heat.
2. Uniforms.
3. Laundry service.
4. Recreation facilities.
5. Affiliation with college courses, in many instances, in which student nurses are given basic instruction in the sciences and for which they receive college credits.

Based upon the above argument, I respectfully request that your committee include in H. R. 10381 such language as will designate accredited schools of nursing supported by hospitals, as being eligible for grants to support the cost of work-study program, as provided under title IV of H. R. 10381.

I take the liberty of suggesting the following amendment to H. R. 10381, title IV, section 402, page 24, line 12: Insert, after the word "institution", the following: "such as clinical nursing experience among the patients of a hospital which operates an accredited school of nursing."

That ends my statement, but I would like to read this letter, and ask that it be included as part of the record. This is a letter addressed to the Honorable Lister Hill, chairman, Committee on Labor and Public Welfare, Senate Office Building, Washington, D. C. Under date of March 11, 1958:

DEAR SENATOR HILL: Testifying on S. 3187 a few days ago, Mr. Charles Dewey, president of the board of trustees of the Washington Hospital Center, urged that schools of nursing operated by nonprofit hospitals be included in the benefits of the bill to the same extent that collegiate schools are included.

We should like the record to show that the American Hospital Association is convinced that governmental aid to schools of professional nursing is seriously needed and is warranted by the public interest, and that such aid should not differentiate between degree-granting and diploma-granting schools.

We recognize that S. 3187 is designed primarily for other purposes, and we would urge merely that to the extent that aid may be accorded to one group of schools of professional nursing, it be accorded also to the other.

Sincerely yours,

KENNETH WILLIAMSON,
Associate Director, American Hospital Association.

I beg leave that this letter be put into the record, sir.

Mr. ELLIOTT. Without objection, it will be made a part of the record at this point.

(The letter referred to is as follows:)

AMERICAN HOSPITAL ASSOCIATION,
Washington, D. C., March 11, 1958.

HON. LISTER HILL,
Chairman, Committee on Labor and Public Welfare,
Senate Office Building, Washington 25, D. C.

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Sincerely yours,

KENNETH WILLIAMSON,
Associate Director.

Mr. DEWEY. That ends my statement and I thank you very much, sir, for the permission to appear before you. I will try to answer any questions that may be directed to me.

If I am unable to do so, I have accompanying me Mrs. Knauff, director of the school of nursing, of Garfield, and which is now a part of the Washington Hospital Center, and is director of the nursing school of that institution.

Mr. ELLIOTT. Mr. Dewey, is the National Nursing Accrediting Service the only accrediting service or agency for nursing schools?

Mr. DEWEY. May I ask, if you please, that that question may be directed to Mrs. Katherine Knauff?

Mr. ELLIOTT. Come around and have a seat, if you desire.

Mrs. KNAUFF. I am Katherine Knauff, director of nursing service and school of nursing, Washington Hospital Center.

The States, also, have licensing of schools of nursing. They require minimum standards. The National Nursing Accrediting Service requires optimum standards.

Does that answer your question?

Mr. ELLIOTT. Let me see if it does.

Of this number of 1,120 nursing schools, only one-fourth, 25 percent, approximately, are accredited by the National Nursing Accrediting Service; is that correct?

Mrs. KNAUFF. They are fully accredited by the National Nursing Accrediting Service.

There are, also, in addition 620 schools of nursing that are temporarily accredited by the same association. These schools that are temporarily accredited, are in the process of seeking full accreditation. I would expect that many of them would obtain it. If is a transition period.

Mr. ELLIOTT. We are in this situation. You seek coverage for this type of situation by the work study program in title IV of my bill? Yet, if I understand, you are already providing these student nurses with the type of scholarship or work study program financed by the institution where they are taking their training or in hospitals, is that correct?

Mrs. KNAUFF. That is correct.

Mr. ELLIOTT. If you got this work study program money for the nursing schools, would that money be in lieu of what you are doing for the student nurse already, or how would it operate. I am trying to get the mechanics in my mind of what we are talking about here, Mr. Dewey.

Mrs. KNAUFF. Mr. Chairman, I would simply say that the sick people at the present time are paying for the services of the student nurse. That is, for the education.

I would hope that the hospitals would be relieved of the responsibility of supporting the educational program in the hospitals.

Mr. DEWEY. May I interrupt and interject there? As president of the board and having worked with that matter for some time—I was president of the board of the Garfield Hospital, which is one of the three constituent hospitals—hospital costs are going up constantly, sir. And the Blue Cross, in many cases their reserves are being eaten into. It is going to be a case of their having to charge the policyholders more money to get the same hospital services that they got

heretofore, or their reserves are going to become completely exhausted.

If we can take some of the burden off the patient which is partially due to the educating of these nurses, it will reduce the cost to the patient and the sick people. And we will attempt to do that.

But at the present time we have to have nurses. There is a shortage of 50,000 throughout the country and that is increasing.

And then again, I would like to point out that the Government itself operates no nursing schools at all, that I know of. And yet it took 16.5 percent of our graduates into the Army, Navy, Public Health Service, Air Force, and other departments of the Government. And also, they go into industry.

Mr. ELLIOTT. Does the Veterans' Administration, we will say, for instance, take a graduate of a fully accredited school and give her credit in its system of being a fully trained nurse?

Mrs. KNAUFF. Yes, sir.

Mr. ELLIOTT. Is the National Nursing Accrediting Service nationally recognized as the main accrediting service in this field?

Mrs. KNAUFF. Yes, sir.

Mr. ELLIOTT. There is no conflict between you and the State boards that are accrediting schools?

Mrs. KNAUFF. No; ordinarily the members of the State board encourage schools in the State to become nationally accredited by the National Nursing Accrediting Service.

Mr. ELLIOTT. Does the gentleman from New Jersey have any questions?

Mr. FRELINGHUYSEN. I am sure that the members of the committee are well aware of the fine service that Mr. Dewey has been rendering, formerly to Garfield and now the new Washington Hospital Center, and I think we are all grateful to your suggestion about how help might be extended to alleviate your financial problems in connection with your nursing schools.

The thing that worries me is how adequate the help would be, and whether if we should broaden the work study program to include nursing schools—obviously, we would not have to—but at least we would not have to consider other institutions or types of activity of a similar kind?

First of all, how many do you have in your nursing schools, and how much assistance you would envision this would provide you if we did enact legislation with this provision in and your school was included? Have you worked out any statistics?

Mr. DEWEY. Mrs. Knauff, who is the director of the school, probably will be able to give you those figures more accurately than I. But as you know, it costs in round figures $1,080 per year to educate a nurse. And when the school is full, we expect to have 280 to 300 nurses.

And under this title IV, there was a 15-percent matching program. By multiplying that——

Mr. FRELINGHUYSEN. That gives me the indication of what it is.

Mr. DEWEY. And we would expect in whole or in part, or under any rule, that the Commission provided under the chairman's bill, we would have to accept and follow such guidance as the rules would provide. The only thing we ask now is not to be left outside of the door as the one type of educational institution which we claim is of higher educational merit, and not even have a chance to participate in any program that in the wisdom of the Congress it may pass.

At the present moment we are not considered, or at least, it is not mentioned in the bill. And I have read the administration bill. And I latched onto it, to title IV which had this working program, and we do give work, and these nurses, the pay they receive in lieu of salary, the recompense they receive, is far more than they could possibly earn in cash money because we give them room, food, light, heat, uniforms, laundry service, recreation facilities, and look after the supplementary programs in colleges. And all we ask now is to be permitted to be covered under the bill for consideration. Then that consideration we may get will depend on the committee that is set up, and the Commissioner that is provided in the legislation.

Mr. FRELINGHUYSEN. I think the proposition is a very interesting one. And I am sure it will receive the consideration that it deserves.

Mr. ELLIOTT. Let me ask Mrs. Knauff this question: Do you require of nursing students that they have courses in the sciences, we will say, or in mathematics, English, that are comparable to college courses in those fields?

Miss KNAUFF. Yes, we do. Are you asking whether or not we recommend the student to have science courses in high school? Is that your question? Or is your question, Are the sciences that you give the student nurse the same caliber as those that they would take in college?

Mr. ELLIOTT. The latter is my question.

Miss KNAUFF. Yes. The answer is "Yes."

Mr. ELLIOTT. Well now, do you actually have these girls trained in colleges for some of those courses, do you?

Miss KNAUFF. At the present time we employ the faculty of District of Columbia Teachers College to do the teaching for us in the basic sciences.

Mr. ELLIOTT. These faculty members from District of Columbia Teachers College come to your nursing school?

Miss KNAUFF. Right.

Mr. ELLIOTT. Here in Washington and provide those courses?

Miss KNAUFF. Right.

Mr. ELLIOTT. And they are comparable to the courses given other students, nonnursing students, in the District of Columbia Teachers College?

Miss KNAUFF. Yes.

Mr. ELLIOTT. Would the same thing be true—do you have courses in English, for instance, that would, also, be comparable?

Miss KNAUFF. In the 3-year diploma program we have no course in English as such. However, the other courses that we have are, certainly, comparable to the courses that are given in the college or university.

Mr. ELLIOTT. Would you list for the record some of the courses that the 3-year nursing student is required to take?

Miss KNAUFF. I will be glad to. Fundamentals of nursing, anatomy and physiology——

Mr. ELLIOTT. May I interrupt? Is the course in anatomy and physiology roughly comparable to a similar course in the college?

Miss KNAUFF. Yes, sir. The instructors at District of Columbia Teachers' College have gone on record as saying that the course that they teach to our students is of the same caliber as the courses taught to other students. We would have no objection to nursing-school

students being in classes with other students studying other types of service.

To continue with the courses: chemistry.

Mr. ELLIOTT. Is chemistry comparable, also?

Miss KNAUFF. Yes, sir. Microbiology.

Mr. ELLIOTT. Now we are getting to a point where I am beginning to get at a loss. Is microbiology comparable to any similar course given in the ordinary college course?

Miss KNAUFF. Yes, sir. Medical and surgical nursing, obstretic nursing, pediatric nursing, psychiatric nursing—those are the major courses; yes, as Mr. Dewey says, of course, we do require that they be high-school graduates in order to accept them in the school of nursing.

Mr. ELLIOTT. Thank you very much, Mr. Dewey and Miss Knauff. We appreciate your kindness in giving us the information.

Mr. DEWEY. Thank you.

Mr. ELLIOTT. I assure you that it will be given every possible consideration.

Mr. DEWEY. Thank you very much again, Mr. Chairman.

Mr. ELLIOTT. The committee will stand in recess until 11 o'clock tomorrow.

(Whereupon at 4:15 p. m., the hearing was recessed, to reconvene at 11 o'clock, March 13, 1958.)

(For continuation of this hearing, see Part 3)

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